REGIONAL OPERATORS AND MECHANICS TRAINING CENTER

Lomé, Togo

Report of

International Road Educational Foundation

1023 Washington Building
Washington 5, D. C.

June 15, 1963

INTERNATIONAL ROAD EDUCATIONAL FOUNDATION

1023 Washington Building Washington 5, D. C.

Sterling 3-6722, Cable "Introadfed", Washington, D. C.

F O R E W O R D

The International Road Educational Foundation is pleased to submit the following report on initiation of a Regional Training Center at Lomé, Togo for the training of heavy construction equipment operators and mechanics from French speaking areas of Africa. This is in compliance with Contract AID/afe-80 between the United States of America and International Road Educational Foundation.

Wm. C. LaBaugh, Jr., Director of Engineering, International Road Federation, was assigned to this project and André Bougon, Vice President, Barber-Greene Overseas, was retained to assist in the work undertaken in Lomé, Togo. This schedule of work is shown in Appendix No. 5.

The proposals contained in this report were made after careful study of the past history of the project, investigation of existing conditions, appraisal of the urgent training needs of the area and study and comparison of the experience of training centers in Mexico City and Cairo, Egypt, U.A.R. The development of a program that would be both effective and practical at minimum cost was given prime consideration throughout.

Robert O. Swain

ROBERT O. SWAIN
Secretary

CONTENTS

		Page
Foreword		
Chapter		
I	General Plan of Operations	1 - 12
II	Tuition, Personnel and Operating Costs	13 - 19
III	Building Requirements	21 - 28
IV	Equipment and Supplies	29 - 34
V	Center Administration	35 - 41
VI	Curriculum	42 - 46
VII	Training Aids	47 - 53
VIII	Implementation of Regional Training Center	54 - 59
IX	Observations on CAO, Mexico	60 - 64
X	Observations on Egyptian Training Center	65 - 67

Appendices:

No. 1	Proposed Revised Project Agreement
No. 2	Plan of Administrative Office
No. 4	Plan of Shop Building
No. 5	Work Schedule
No. 6	Contacts in Togo

Chapter I

GENERAL PLAN OF OPERATIONS

Operation Plan

After due consideration of all factors involved it appears reasonable to plan for the opening of the Center for a class of 30 operators beginning February 15, 1964.

This will require prompt construction of the proposed administration office, equipment shed and workshop. The procurement of equipment, supplies and training aids must then be initiated and later the recruitment of technicians must proceed so as to insure coordination and arrival in Togo coincident with completion of the buildings and the opening of the Center.

The previously proposed dormitory and cafeteria would not be constructed as present plans call for use of private board and lodging facilities available in Lomé at reasonable cost. Per diem allowances would be advanced on a weekly basis to trainees.

The plan of operation allows for completion of the office and equipment shed in time for the February 15, 1964 opening date for the first class of operators. The completion of the workshop is scheduled so that a first class of ten mechanics can be enrolled on May 15, 1964.

This will require prompt decision by AID/W on recommendations made by the team concerning construction of the buildings and notification of AID/TOGO and the GOT to proceed with recommended changes, so that plans and specifications can be made ready for bid advertisement. Waiver to allow free-world material procurement by the contractor must be processed immediately so that the GOT can make bid advertisement by June 15, 1963.

Initially two courses for operators will be offered — one on motor grader operation and the other on heavy tractor operation, including bulldozer blade, ripper attachment and operation with an earthmoving scraper pan. The courses will extend for three months with a planned total enrollment of 30 operators.

Three cycles of three months courses, allowing training of a total of 90 operators per year is planned. There will be no operator training class during the three month period — May 15th through August 15th — rainy season.

The course for mechanics will extend for one year (4 three-month periods). The initial class of 10 mechanics will start on May 15, 1964. Every three months thereafter a class of 10 operators will be enrolled. This will allow training of 40 mechanics per year with 10 graduating and 10 new trainees enrolling each three months. The rainy season will not prevent continuation of mechanics classes throughout the year.

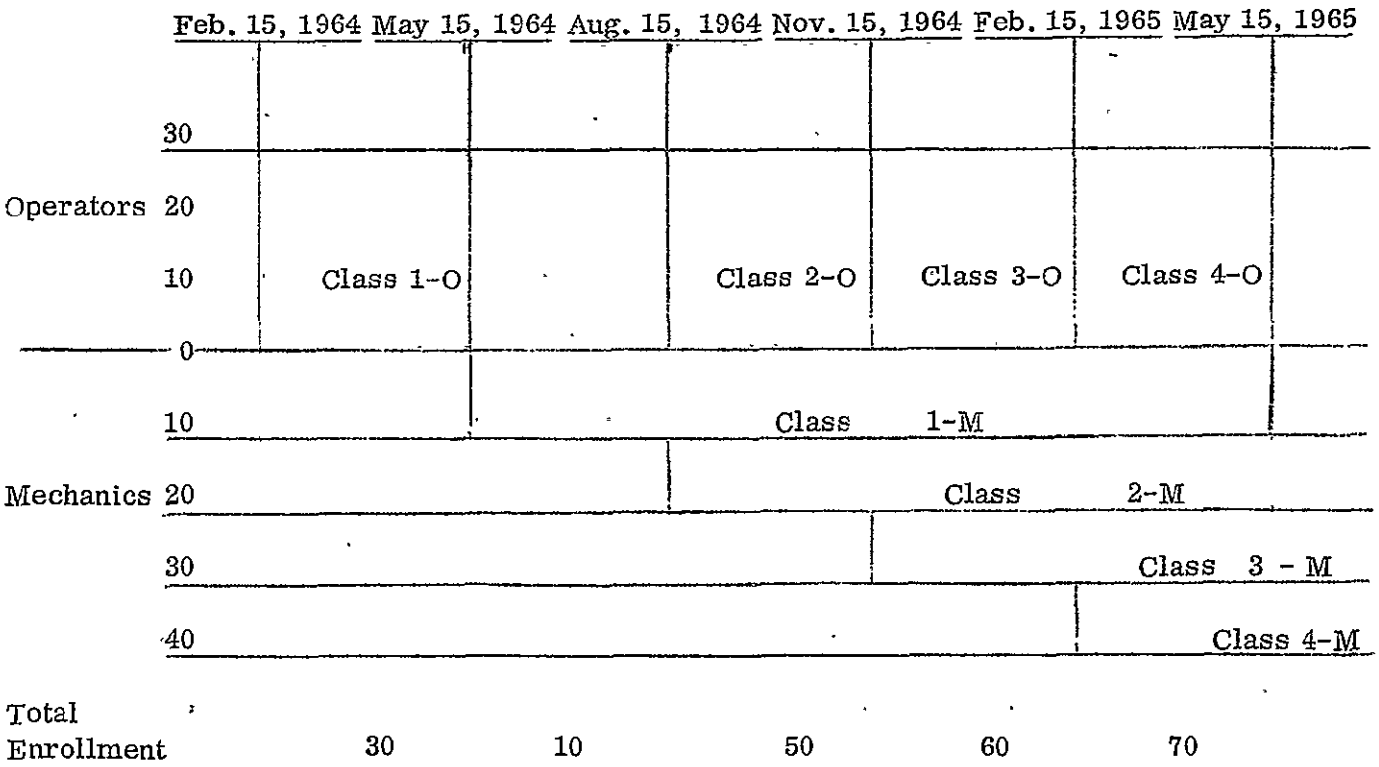
Proposed Schedule of Training Sessions
And Number of Trainees

Session	Total Enrolled in Center	
	Operators	Mechanics*
February 15, 1964 to May 15, 1964	30 (Class 1-0)	0
May 15, 1964 to August 15, 1964	0	10 (Class 1-M)
August 15, 1964 to November 15, 1964	30 (Class 2-0)	20
November 15, 1964 to February 15, 1965	30 (Class 3-0)	30
February 15, 1965 to May 15, 1965	30 (Class 4-0)	40
May 15, 1965 to August 15, 1965	0	40

Note: Operator Training consists of one session (3 months).

*Mechanics Training consists of 4 sessions (1 year) with 10 new trainees accepted each session.

Chart Showing Class Enrollment



Personnel

As required in the Project Agreement the Director, U.S. AID/TOGO, or his delegate, and the GOT Minister of Public Works, or his delegate, shall jointly administer the Center and shall select a Center Director.

The Center Director's salary and any maintenance expenses will be paid by the GOT. The GOT will also supply, to the extent possible, two qualified assistant instructors.

Four technicians will be hired and their salary and maintenance expenses paid by AID. These will include two U.S. technicians, one as Technical Manager and the other as Assistant Technical Manager. The other two technicians, Chief Instructors, might be third country-nationals. All technicians should be able to speak French.

A Peace Corps team of 16 men, consisting of highway foremen, mechanics and parts identifiers, is scheduled for assignment in Togo beginning in October, 1963. It is proposed and is agreeable to AID in Togo that four of these be selected to serve as assistant instructors at the Training Center.

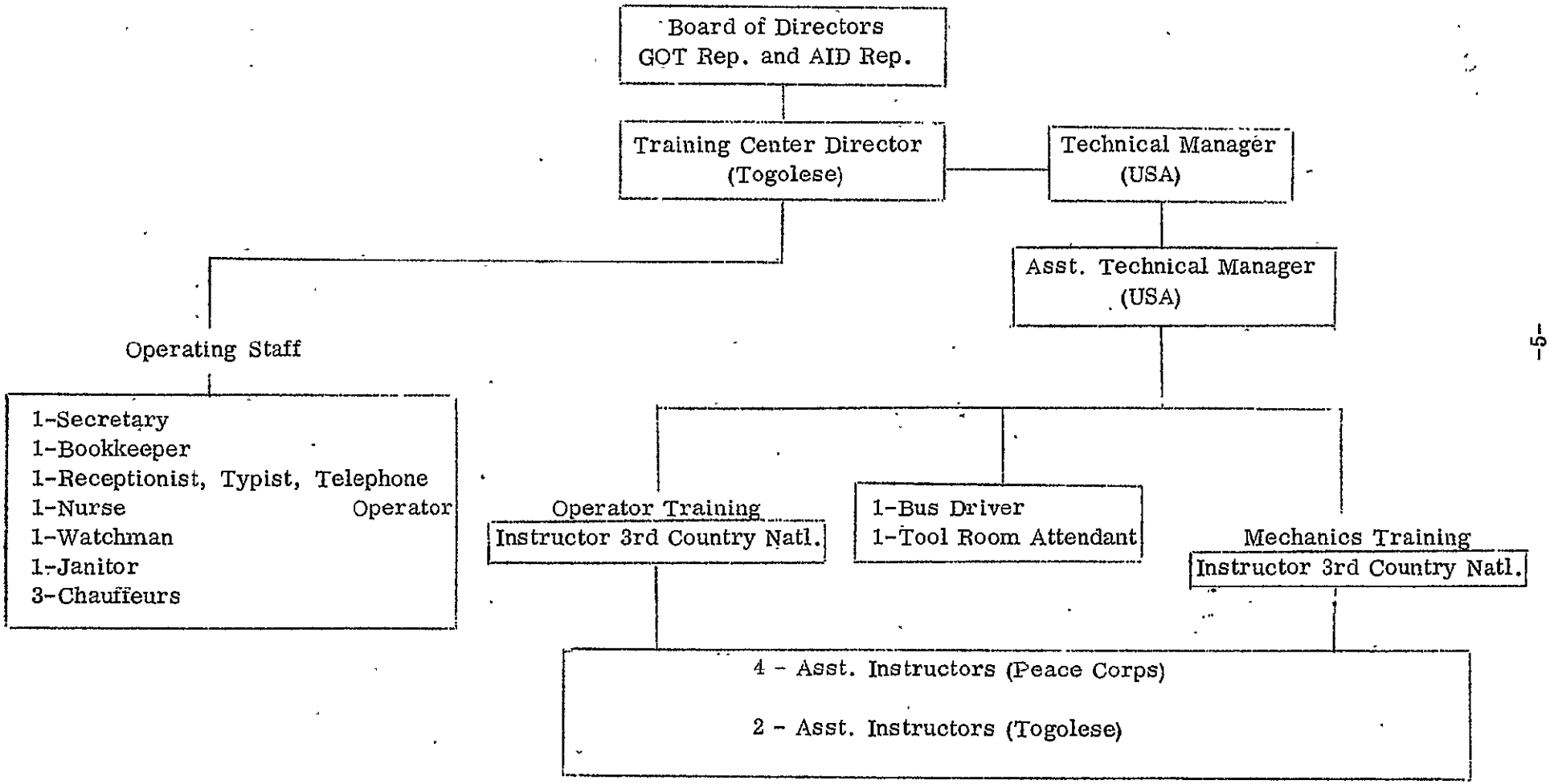
The Organization Chart on the following page shows these various positions.

Duties of Training Center Director

The Director shall recruit, employ and direct all of the personnel for the running of the office and maintenance of the Center.

He shall be responsible for the reception and orientation of trainees, and their physical and social welfare. This will include assistance in obtaining board and lodging in Lomé, supervision of per diem disbursements, maintenance and control of a furniture pool for trainees and maintenance of discipline.

ORGANIZATION CHART



Duties of Technical Manager and Assistant Technical Manager

The Technical Manager shall have jurisdiction in matters pertaining to the instruction of trainees. This will include supervision over instructors, programming of classes, use of equipment, control of the Center Shop repair activities, and initiating changes in the curriculum if needed. He shall also assist in classroom instruction.

He shall be responsible for the securing of spare parts, fuel and similar supplies, having direct control over the special account to be set up to cover these items. If such parts or supplies are not readily available at the Public Works Department he shall have authorization to take the necessary action to obtain these through commercial channels.

The Assistant Technical Manager shall assist the Technical Manager in all of his duties and also shall instruct in the classroom and/or the field.

Duties of Chief Instructors

One Chef Instructor shall be in charge of instruction of mechanics and the other shall be in charge of operators' instruction. They shall conduct classroom and field exercises for the students and shall have direct supervision over the assistant instructors.

Training Objectives

In order to serve as a regional Training Center the facility must offer a program superior to that which can be obtained through local on-the-job training. The area to be served has need for advanced operator and master mechanic training. These trained people might thereby form the nucleous for supervision of on-the-job training activities when they return to their various countries.

The primary training objective will be to take people with demonstrated aptitude and some minimum experience and upgrade them to a high level of competence.

Operators would be taught how to obtain maximum results from their equipment. They would at the same time be taught the necessity and practice of daily routine equipment maintenance as well as more complicated maintenance and adjustment procedures.

Mechanics would be instructed in major overhaul of a variety of equipment. They would also be instructed on analysis of equipment malfunction, emergency repairs, use of basic machine tools and some basic theory on carburetion, electrical systems and drive train systems.

Prerequisites for Trainees

Prerequisites for a mechanics trainee are that he shall be literate, have a minimum experience of two years as a mechanic helper or operator of equipment, have a demonstrated aptitude and be in the 20 to 35 year age bracket. Under special conditions and with adequate justification applicants up to 40 years of age might be accepted. This, however, should be the exception rather than the rule.

Operator trainees would be accepted in the 18 to 35 year age bracket. A minimum of one year of experience as assistant operator and a demonstrated aptitude would also be required. While literacy is desirable, it is felt that at the present time it should not be required for operator trainees.

All applicants must have a certificate of good health.

Project Agreement

The original project agreement dated May 30, 1962 was reviewed by the IREF team and discussed at length with AID/TOGO and U.S./TOGO Embassy officials.

This brought out several deficiencies in light of present conditions and the present plan of operation for the Center.

A revised project agreement was drafted by the team. This was also translated into French by André Bougon, team member, and copies made available to AID. The draft was reviewed and further revised by and with AID/W officials and a proposed project agreement developed. This agreement is included in this report as Appendix No. 1.

This revision reflected increased cost for technicians for a two rather than a one year period, reduced cost of building construction due to elimination of cafeteria and dormitory, and increased cost of commodities. It also took into account the co-operative arrangements for use of the Tokoin Public Works facilities and the costs to be covered by tuition charges.

U.S. Contribution

A summary of the U.S. contribution follows:

1. Contract Services/Technicians

2 - U.S. Technicians (1 Year)	$ 59,400	
2 - Instructors (1 Year)	41,000	
Contract Services - Administration	12,000	
	$112,400	
Present Contract with IREF (AID/afe/80)	13,000	
		$125,400
Technicians (2nd Year)		
2 - U.S.	$ 50,200	
2 - Instructors	41,000	
		$ 91,200
Total		$216,600

2. Commodities

Shop Equipment and Hand Tools	$ 52,000	
Heavy Equipment and Vehicles	207,000*	
		$259,000**
Office and Shops Supplies (Paper, Soap, etc.)	$ 1,000	1,000
Total		$260,000

3. Other Costs

Estimated Cost of Center Buildings and Furnishings

Workshop	$ 68,000	
Administration Building	27,400	
Equipment Shed	5,000	
Office Equipment	8,000	
Roads and Walks	6,000	
	$114,400	
Contingencies	8,600	
		$123,000

Estimated Cost of Housing and Furnishings for 2 U.S. Technicians and Pool of Room Furniture for Trainees

House Rental and Utilities for U.S. Technicians	$ 29,400	
Household Furnishings for U.S. Technicians	10,000	
Furniture for Unfurnished Rooms Rented by Trainees (Pool of cots, tables, chairs and simple wardrobes)	2,000	
		$ 41,400
Spare Parts Account (1 Yr. supply)	$ 15,000	
Fuel and Oil Account (1 Yr. use)	10,000	
Supplies for Shops, such as welding rods, oxygen, wiping rags, etc.	1,000	
		$ 26,000
Total		$190,400

Note: *Training Center bus not new, but surplus acquisition.

**As much equipment as possible should be obtained from excess property. Engines and assemblies for mechanics training might also be secured from excess or by manufacturers donations.

Future U.S. Assistance

U.S. assistance to this project should be anticipated for six years. This conclusion is based on a review of the history of the Mexico and Egyptian Training Centers and discussions with AID personnel who were instrumental in development of these projects.

Togo Contribution

Togo is furnishing the land for the Center and use of existing facilities such as access roads, power lines and water system. The salary and maintenance expenses of the Center Director will be paid by the GOT. To the extent possible Togo will also supply and pay two Public Works mechanics or operators to act in the capacity of assistant instructors.

The GOT is and will supply architect and engineering services required for the design, award of contract and construction of the Center buildings. The GOT further agreed to contribute any available additional service of its Public Works Department on a cost basis to U.S. AID, for the construction and equipment of the requisite facilities.

Training and demonstration equipment procured during FY 1961 under project 693-F-31-AA (693-31-003), dated June 3, 1961, will be made available to the Center by the GOT.

The GOT also agreed to furnish such other services and supplies within the limitation of available resources as are required to meet the objectives of the Center. These include facilities of the Public Works Tokoin Equipment and Shop Area adjacent to the Center location.

Tuition Obligation

Tuition, to be paid by governments, agencies or private entities sponsoring trainees, will be used to defray the cost of operation of the Center, such as cost of utilities, salaries of office staff, janitors and chauffeurs, medical services, cost of parts and supplies consumed, and student per diem.

Training Center Justification

Considerable emphasis has been placed in the past on the future prospects for this Center and its continuation after AID withdraws support. It is evident that the Center could not absorb the relatively high cost of U.S. and third country national administrators and instructors without some outside support. It is imperative therefore that selected local individuals be recruited and trained to assume these positions prior to termination of U.S. AID assistance.

A potential saving of $1,407,780 will be provided by the first six years of Training Center operations. Therefore, even if Center operations should be completely terminated at that stage it would have more than paid for itself. In addition, it would have provided training to a potential six-year enrollment of 540 operators and 240 mechanics which are sorely needed in Africa.

In addition to cost there are many potential trainees for this Center who are unsuited, both in language and custom, for training in the U.S.

This Center would allow training of operators and mechanics at $710 per quarter plus international transportation averaging $200 per student. The alternative is to send these trainees to the U.S.A. as is now being done by some AID missions at considerably higher costs.

In the first year 90 operators will each receive three months training and 30 mechanics will receive from three to nine months of training. In following years 90 operators per year will each receive three months training and 40 mechanics per year will each receive one year of training.

Training one of these operators for three months in the U.S. is currently costing $3,626 ($1,166 per diem, $1,200 transportation, $900 tuition, $60 books, and $300 administration costs). Training of one of these mechanics for one year in the U.S. would currently cost $8,636 ($4,326 per diem, $1,200 transportation, $2,600 tuition, $60 books, and $450 administration costs). Training which will be provided in the first six years of Center operation would cost $3,814,780 if trainees were sent to the U.S.

The 540 operators to be trained in the Center the first six years would cost $1,958,040 if trained in the U.S. The Center would also provide training equivalent to 215 mechanics each for one year which would cost $1,856,740 if performed in the U.S.

Center costs estimated for the first six years total $2,249,000, including the buildings, equipment and all salaries and expenses. This cost is estimated to come from the following sources:

U.S. AID.....	$1,159,000
Tuition.....	980,000
Togo Contribution..	110,000
	$2,249,000

To this amount must be added an estimated cost of $158,000 for students international travel to establish a total cost comparison with equivalent training provided by sending trainees to the U.S. The $3,814,780 U.S. alternate compared to the $2,407,000 total Regional Center program results in the $1,0407,780 potential saving.

Chapter II

TUITION, PERSONNEL AND OPERATING COSTS

Tuition

In the first year of operation the Center is scheduled to handle 150 student quarters.

First year operating costs, other than for administration or instruction personnel, are estimated at $86,770, and amortization of equipment is estimated at $20,000. Administration and instruction costs are estimated at $133,000.

The following tuition rates per 3-month course would therefore be required:

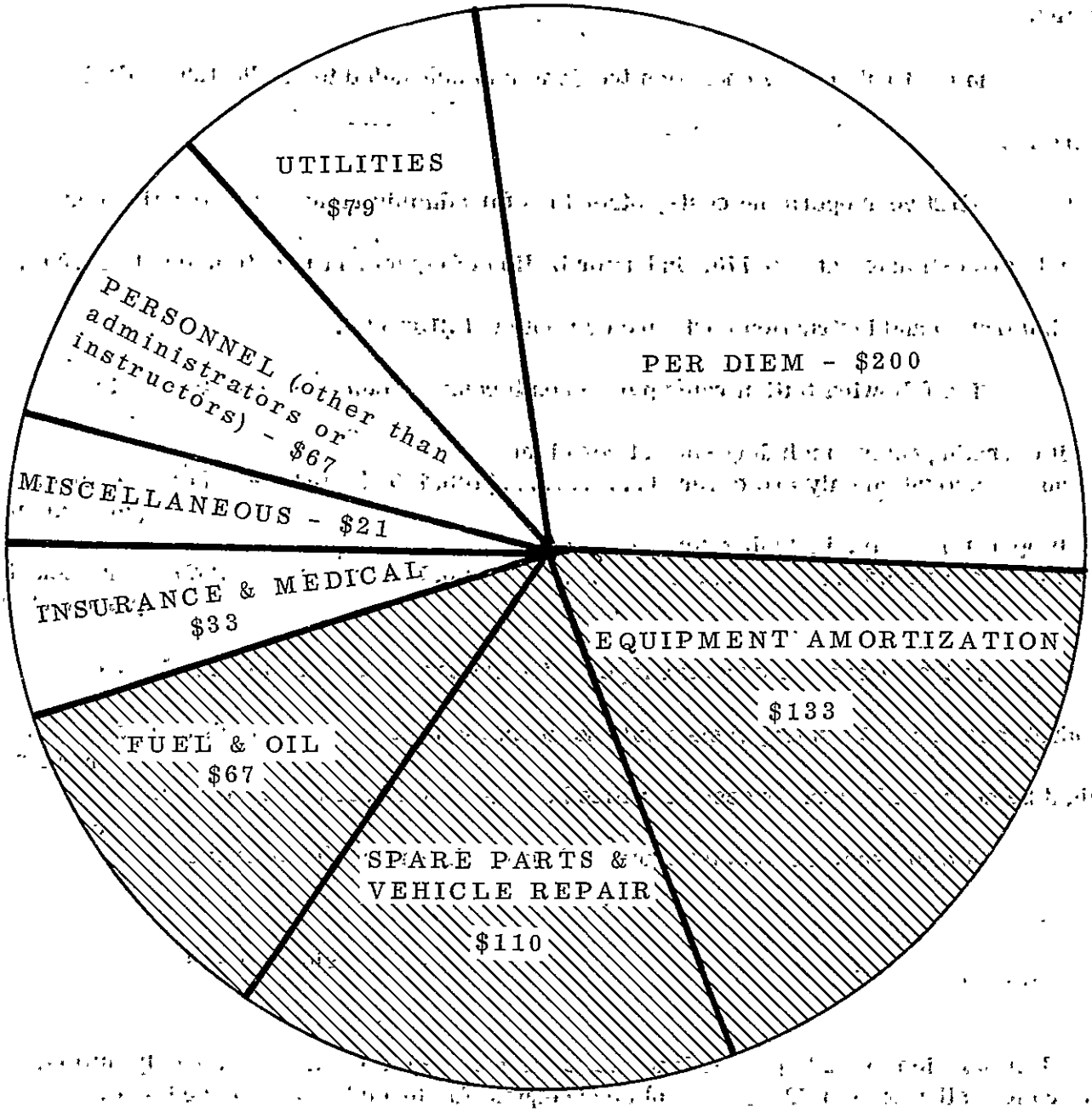
If operating costs, including student per diem and amortization only are covered	$106,770	÷ 150	=	$710*	per student per quarter
If operating costs, including student per diem only are covered	$ 86,770	÷ 150	=	$577*	per student per quarter

In the second and subsequent years the Center is scheduled to handle 250 student quarters. Operating costs would not increase appreciably and tuition costs might be decreased or any excess be utilized to finance expansion of facilities.

A chart showing the distribution of tuition fees is on the following page.

* Student per diem of $200 per student quarter is included in the above quarterly tuition. Per diem allowance of 525 CFA would be adequate for furnished lodging and food. Many furnished rooms are also available and a furniture pool should be maintained by the Center Director for those trainees who rent such rooms. A sum of $2,000 has been budgeted for purchase of cots, tables, chairs and simple wardrobes for 20 to 30 trainees. The per diem allowance for trainees to which furniture is loaned will be reduced to 500 CFA.

TUITION DISTRIBUTION



Personnel

Personnel costs were estimated on the basis of existing rates and allowances paid by U.S. agencies for similar positions in Lomé, Togo. Rates of pay for Togolese employees were also discussed with local businessmen and with the President of the Chamber of Commerce.

Personnel requirements for planned operation of the Center are indicated below along with estimated salary requirements for the office and maintenance staff. Such salaries would be paid out of tuition payments.

CENTER STAFF AND OPERATING PERSONNEL

Position	GOT	AID	Tuition	Office & Maintenance Staff Cost 1st year CFA
1 - Center Director (Togolese)	X			
1 - Technical Manager		X		
1 - Asst. Technical Manager		X		
2 - 3rd Country Instructors		X		
2 - Togolese Asst. Instructors	X			
4 - Peace Corps Asst. Instructors		X		
1 - Secretary (Togolese)			X	325,000
1 - Typist "			X	275,000
1 - Bookkeeper "			X	400,000
1 - Janitor "			X	90,000
1 - Night Watchman "			X	100,000
1 - Bus Driver "			X	170,000
1 - Tool Room Attend. "			X	250,000
1 - Nurse " (Assistante Sociale Auxiliaire)			X	250,000
3 - Chauffeurs "			X	375,000
				2,235,000

2,235 CFA = $8,940 (US)

Estimated

Center Operating Costs - First Year

Togolese Personnel - Other than Administrator and Instructors	$ 10,000
Student per diem at 525 CFA per day	30,000
Utilities at $1,000 per month	12,000
Spare Parts - Heavy Equipment	15,000**
Gasoline, Diesel Fuel and Lube Oil:	
20,000 gallons Diesel Fuel at $.40	8,000**
3,500 gallons Gasoline at $.53	1,855**
Lube Oil and Grease	175**
Postage and Telegrams	1,000
Telephone	240
Office and Shop Supplies (Paper, mops, bulbs, soap, welding rods, rags, etc.)	2,000
Station Wagon and Bus Repairs	1,500**
Medical Supplies and Doctor Fees	2,000
Insurance covering accidents to trainees	2,000
" " " " Togolese employees	300
" " " " Third Parties (on vehicles)	700
Amortization of Equipment	20,000**
Total Cost To Be Met by Tuition Payments	$106,770
Contract Cost for recruitment of personnel and administration of starting Center operations, including equipment procurement	$ 12,000
AID Sponsored Technicians (4)	113,000
GOT Sponsored Technicians (3)	8,000*
Peace Corps Technicians (4)	
Center Operating Costs Borne by U.S. and GOT	$133,000

Note: * Rough Estimate
** Funds to be administered by Technical Manager

Cost of insurance against accidents to trainees and Center personnel has been included in the operating costs. This would appear to be necessary to prevent action against Center administrators or instructors if accidents occur.

Costs were also included for third party coverage on all vehicles and equipment. As a regional activity, title and responsibility might rest with the Center and not the GOT and this insurance coverage is therefore recommended.

Estimated Costs - U.S. AID Financed - Technicians

	Technical Manager	Asst. Technical Manager
Base Salary	$13,500	$11,500
25% Differential	3,375	2,875
Post Allowance	2,100	2,000
	$18,975	$16,375
*90 day TDY Allowance	$ 6,300	$ 6,300
**Housing - 9 Months at $700	6,300	6,300
Education Allowance	1,300	1,300
	$13,900	$13,900
U.S. Transportation	$ 500	$ 500
*International Travel (3-1/2 one way)	1,750	1,750
*22# Overweight allowance per person	320	320
*100# Airfreight allowance per person	400	400
*200# Seafreight per person	300	300
Automobile Shipment allowance	500	500
Household Effects (2,000 lbs.)	750	750
	$ 4,520	$ 4,520
Total Cost (1st Year)	$37,395	$34,795
Second Year Cost Housing & Education Allow.	$ 9,700	$ 9,700
Rest & Rehabilitation Leave (Marseille)	1,570	1,570
Total Cost (2nd Year)	$34,765	$32,165

Note: *Based on 3-1/2 members in family (Couple and 2 children, one under 12).

**Small furnished hotel apartment $480 per month for 2 people.
House rental $2,500 per year plus $4,000 to $5,000 improvement cost, plus electricity at $250 per month, plus gas at $17.50 per month, plus water. Housing to be secured, furnished, and utilities provided for by AID/Togo.

Estimated Cost of (3rd Country Nationals) Instructors - AID Financed

French nationals working in Togo as equipment superintendents were reported to receive the following:

Base Salary	90,000 CFA per month
	50,000 hardship post differential
Total Salary	140,000 while working in Togo

Furnished housing and utilities are supplied as is a car which can be used for private as well as company reasons. In addition they receive two months vacation in France each year. International travel is paid for all members of the family and they receive their base salary for these two months.

The above is used as a guide in estimating compensation for third country nationals working as instructors.

Base Salary	$6,000	per year
25% Differential	1,500	" "
Post Allowance	1,500	" "
	$9,000	" "
*30-day TDY Allowance	$2,100	1st year
**Housing 11 months at $600	6,600	" "
	$8,700	" "

*International Travel (3-1/2 one way)	$ 950
*22# Overweight Allowance per person	200
*100# Airfreight Allowance per person	250
*200# Sea Freight per person	200
Automobile Shipment Allowance	350
Household Effects (1,500 lbs.)	400
	$2,350

Total Cost 1st Year (per Instructor) $20,050

Note: Footnotes shown bottom of next page.

Estimated Cost of (3rd Country Nationals) Instructors - Cont'd

Second Year Cost of Housing	$ 7,200
*R. & R. Leave (Marseille)	1,620
Total Cost 2nd Year (per Instructor)	20,170

Estimated cost of recruitment and administration of Center initiation if done by contract $12,000

Note: *Based on 3-1/2 members in family (Couple and 2 children, one under 12).

**Small furnished hotel apartment $480 per month for 2 people. House rental $2,500 per year plus $4,000 to $5,000 improvement cost, plus electricity at $250 per month, plus gas at $17.50 per month, plus water.

Chapter III

BUILDING REQUIREMENTS

Buildings

(1) An administration building (see plan-Appendix No. 2) has been considered necessary throughout the various stages of development of this project. The administrative and technical staff of the Center must maintain adequate records on students as well as records on operation and expenses of the Center. Applications for admission of students from a number of neighboring countries will be received and processed. Tuition funds must be collected and operating funds disbursed. Effective administrative direction requires daily on-the-site supervision. This cannot be done effectively or economically unless an adequate building is provided at the Center site. The site is located outside of the city and even if the administration offices were located within Lomé, suitable existing buildings are not available.

The administration building has been designed as an independent building because of the hot and humid climate, to provide for insulation from noise of equipment and shop machinery operations, and also so that it may be kept in a clean and uncluttered condition.

As an independent structure it lends itself to the proposed stage construction of the Center. The proposed staff will include 5 administrators or instructors and 6 assistant instructors, as well as 4 office employees.

The conference room will also serve as a library.

(2) An equipment storage shed (see plan-Appendix No. 3) is considered essential for equipment protection and to serve as an outdoor classroom for various demonstrations on the equipment. Construction of this shed in the first construction stage

will allow initiation of operator training classes prior to completion of the main workshop. The 16X20 meter building which is proposed would also provide sheltered storage for the equipment during the rainy season when operator instruction will be suspended.

(3) The workshop, plans for which have been undergoing development and revision for the past 16 month, is considered to be adequate and necessary for the development of the program. This will be used primarily in the instruction of the mechanics. (Several minor revisions in plans are recommended to provide better accommodations and are shown in Appendix No. 4 and on layout plan attached).

The need for the training of master mechanics expressed by many of the countries participating in this project would make early initiation of mechanics training desirable.

The mechanics course is scheduled to start in the second quarter of Center operations and the shop should therefore be included in the initial construction contract and be programmed to be completed after the Administration Building and the Equipment Shed.

(4) The proposed dormitory and the cafeteria should be deferred.

On the spot inquiries indicate that trainees should have no difficulty in finding board and lodging at a reasonable cost in Lomé. Contractors, businessmen and officials interviewed felt that trainees would be better satisfied with this arrangement rather than being quartered in a dormitory and fed in a center cafeteria.

If in the future conditions should change, and trainees have difficulty in securing board and lodging in Lomé, construction of a dormitory and cafeteria might then be considered. However, no future difficulty is foreseen at this time.

Stage Construction of Buildings

Initial construction of the administration building and a 4-bay metal hangar type equipment shed is proposed. The equipment shed would be similar to that shown in PLAN No. 47/B.E./62/T.P. of the Togo Ministry of Public Works. Sides would be left open and a compacted laterite floor provided. This building would be 16 meters wide, 20 meters long and 5 meters high (floor to bottom chord of roof truss).

A similar 8-bay building is programmed by the TP for construction for their equipment at the old airport buildings complex adjacent to the Center now designated as the Tokoin TP Area. Cost is estimated at 2,900 CFA per m^{-2} ($11.60) for the buildings plus 500 CFA per m^3 for the laterite floor.

If similar prices were to apply the 16X20 meter shed for the Center would total 928,000 CFA ($3,712) for the building, plus approximately 50,000 CFA ($200) for the laterite floor. It is estimated, however, that costs will run somewhat higher and a total of $5,000 has been budgeted.

Upon completion of these two buildings the class for operators can be accommodated. Outdoor class instruction on the equipment can be held in the shed which will also provide protected storage of the equipment. Indoor class lectures and films can be held in the small classroom provided in the Tokoin TP Area and now used by Mr. Brignac, AID/Togo.

Construction of the shop building should be included in the original construction contract with a provision that the administration building and equipment shed be completed before work begins on the shop.

Building Requirements Review

The IREF team reviewed plans and specifications for the buildings proposed for the Training Center. An on-site inspection in the company of Messrs. Dossou and Coustere of the GOT resulted in suggestions for changes in building location and in some building plan details. Investigation of the availability in Lomé of room and board for trainees and the apparent difficulties inherent in boarding and feeding people of different eating habits in a central installation led to a plan to operate the Center on a per diem allowance basis. This does not require construction of a dormitory or a cafeteria which were included in previous plans.

Mr. Wm. H. Coster, Jr., AID/RHT/Lagos was unable to visit Togo while the team was there, but arrived later and reviewed the suggested changes. His report on this review was submitted to Harry J. Petrequin, Jr., AID/Togo Liaison Officer on May 9, 1963. In general he took exception to the changes proposed by the team. Unfortunately many of his objections were based on a previously held concept of Center operations which did not tie in with the use of existing Tokoin TP Area facilities, or the use of lodging and boarding facilities in Lomé, which is the basis of the IREF plan of operations. His report in other respects presented additional pertinent information which, the IREF team recognized as valid reasons precluding their suggested changes.

All of this material was reviewed by Mr. F. J. Maiolo, AFE/CDF/ENGR and A. H. Ellis, AFE/DP with W. C. LaBaugh, IREF. This resulted in the following conclusions and recommendations:

The layout plan for the facility No. 47/BE/62/TP was found to be incomplete by the IREF team in that it did not show the existing and proposed facilities of the

Public Works Tokoin Equipment and Shop Area, which will play a part in the presently proposed Center operations. The locations of existing concrete based steel powerline poles, which are located approximately on the center line designated as Axe No. 1, also were not indicated. The plan also was found to be in error as to the location of the new airport road which was found to be actually located somewhat further west.

The team noted a small occupied building located approximately on the site proposed for the administration building. This was part of the old airport complex and must be evacuated and removed.

As no provision appeared to be made for this in the plans and specifications the team raised the question of responsibility and Mr. Dosson indicated that the Public Works Department would handle this matter without cost to the project.

The IREF team proposed several changes in the layout and building plans based on a plan of operations which would not require dormitory or cafeteria facilities and one which would make use of certain Tokoin Public Works Area facilities. These changes included the following:

1. Construction and paving of the road in front of the Center, the area in front of the shops, the concrete islands at the shop driveway entrance, and the office parking area after completion of the buildings. This road work is to be done by Center trainees and Public Works employees under the direction of Mr. Henry Brignac of AID/Togo.
2. Paving width to be a maximum of 8 meters located generally to the north of the road centerline (Axe No. 1) shown on the

layout plan and, at least for the present, not to extend in length to the west beyond the limits of existing Tokoin Public Works Area buildings (see revised plan attached). Under this procedure existing concrete based steel power poles would not have to be relocated and the road would be sufficient in width for anticipated use.

3. Shop Building (B) to be constructed 35 meters from the road centerline, Axe No. 1, in order to save on the considerable paved area in front of the building. This will also provide additional room to the rear of the shop buidling for the operator training area.

4. The proposed 37 meter long concrete island originally proposed for construction be either eliminated or reduced to 27 meters in length and shifted 10 to 12 meters closer to the centerline, Axe No. 1 (see revised plan attached). This will allow adequate access to the shop for all equipment.

5. Administration Office Building (A) to be constructed 17 meters from the road centerline, Axe No. 1. This will allow better air circulation and placement with respect to the relocated shop building (B) - (see revised plan attached).

6. Dormitory (D), Cafeteria (C), Playing Area (F) and Drying Yard (G) would not be constructed.

7. As existing Tokoin parts storage facilities would be used by the Center, the shop storeroom would serve as a security area for

boxes and parts from knocked down engines and for storage of training assemblies. Therefore, a door will be added to provide direct access between the storage room and the central working area.

8. As a small classroom is available at the Tokoin Public Works Area, and as the Bureau in the shop might also be used for small classes, the need for partitioning of the large class/projection room was not considered necessary. The accordion type wooden partition was therefore considered to be an unnecessary expense. This type of partition also often does not provide a satisfactory separation for classes.

9. A ventilating fan should be provided for the class/projection room as this must often be closed up for showing of movies and slides.

10. Ceiling fans should be provided in the Administration Office even though the type of construction allows maximum cooling from prevailing winds.

11. Four showers are shown on PLAN No. 35/BE/62/TP in the "TOILETTE." However, in the specifications under Article 13 of the "Devis Descriptif Particulier" only 3 showers (Douches) are specified and should be changed to require four before the project is let to contract.

12. Floor covering of asphalt or vinyl tile, recommended by the IREF team, will not be provided in the office.

13. The equipment shed shall be constructed and located within the on-site training area southwest of the shop, as shown on the revised layout plan, without encroaching on the area reserved for possible future construction of a dormitory and a cafeteria. It would encroach somewhat on the area originally reserved for washing and playing activities.

14. (A) Partitions between shop sections, except the diesel section, shall consist of a wall 1 m 90 high topped by a 1 m 10 high metal grill. The diesel section shall be totally enclosed with full walls and ceiling.

(B) Front interior walls of the following sections shall consist of a 1 m high wall topped by a 2 m high metal grill:

1. Section Electrique
2. Salle D'Outils
3. Salle Des Machine
4. Magasin Pieces Detachees

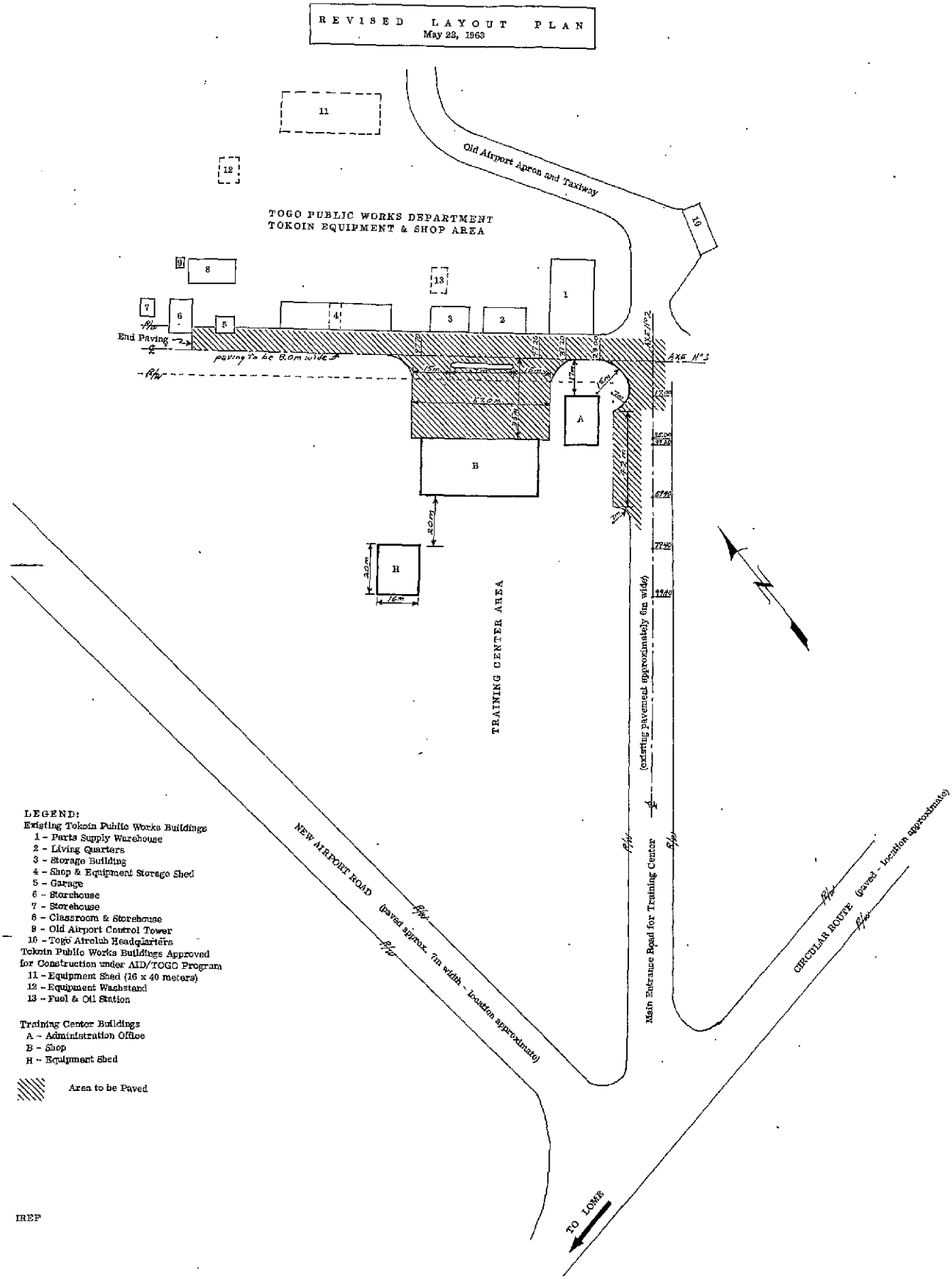
This will not only assist with ventilation but will also assist instructors in surveillance.

15. Location of all sections and other rooms will remain as shown on Plan No. 35/BE/62/TP as recommended by Mr. Coster.

16. Specifications for the construction of the Administration Office, the Equipment Shed and the Shop shall require completion of the first two mentioned building within six months and the Shop within nine months of notification to contractor to proceed with work.

Plans and specifications shall be amended to include all of the above noted revisions prior to letting of work to bidding.

REVISED LAYOUT PLAN
May 28, 1963



LEGEND:

Existing Tokoin Public Works Buildings
- 1 - Parts Supply Warehouse
- 2 - Living Quarters
- 3 - Storage Building
- 4 - Shop & Equipment Storage Shed
- 5 - Garage
- 6 - Storehouse
- 7 - Storehouse
- 8 - Classroom & Storehouse
- 9 - Old Airport Control Tower
- 10 - Togo Airclub Headquarters

Tokoin Public Works Buildings Approved for Construction under AID/TOGO Program
- 11 - Equipment Shed (16 x 40 meters)
- 12 - Equipment Washstand
- 13 - Fuel & Oil Station

Training Center Buildings
- A - Administration Office
- B - Shop
- H - Equipment Shed

Area to be Paved

IREF

Chapter IV

EQUIPMENT AND SUPPLIES

Shop Equipment Requirements

Electric power available to the Center is 220 volt, 50 cycle one phase and three phase. All power equipment must conform to this source.

The Tokoin Shop of the TP adjacent to the school will be equipped with some machine tools which can be used for instructing the mechanics. These include:

Track Pin and Bushing Press
Arbor Press, 40 Ton, McMaster Carr
Riveting Machine, automotive brake shoe and lining
Brake Drum Lathe

Shop equipment for the Center will supplement and not duplicate the major pieces of the Tokoin Shop equipment. However, frequently used and small power tools such as grinders, drills, etc. would be duplicated for the Training Center.

Training Center

Shop Equipment Requirements

1 - Crankshaft grinder (Up to D-7 crankshaft)	$20,000
1 - Diesel fuel injection test bench with adaptors and injection tester	5,000
1 - Electric welder, trailer mounted 300 amp with G.M.C. diesel engine	2,880
1 - Engine analyser same or equal to "Snap-on" #MT 400B	410
1 - Battery charger	150
2 - Chain hoists (manual 2 & 5 T)	809
2 - Bench grinders (3/4 HP)	310
1 - Lathe 10" to 12" swing, 36" c to c on stand 220 v/50 cycle	1,000
For'd	$30,559

Shop Equipment Requirements (Cont'd)

Brot. For'd.....	$30,559
1 - Lathe 14" swing, 36" c to c on stand 220 v/50 cycle.....	3,000
1 - Oxy-Acetylene welding equipment set with acetylene generator and welding and cutting torches.....	409
1 - Blacksmith forge 24" X 50" with hand blower and water tank.....	186
8 - Vises, 6" jaw, stationary base.....	400
1 - Arbor press (10 ton).....	293
1 - Steam Cleaning Unit - Aeroil Model CL-150.....	1,050
" " " - Cleaning Compound.....	250
" " " - Spare Parts.....	200
1 - Drill Press with bits (1/2" capacity).....	250
2 - Electric Drills, portable (1/4" & 1/2" capacity).....	100
1 - Set of Valve Seat Reamers and Grinders.....	193
1 - Cylinder hone and burnishing for use with electric drill.....	8
2 - Dolly Jacks - 10 ton.....	830
1 - Air Compressor with air tank-automotive tire inflation, skid mounted, electric drive 2 HP, 3 phase, 50 cycle, 220 volt (Wayne model 378-H with switches).....	432
1 - Prest-O-Lite 5-in-one blow torch for LP gas..... (To repair radiators)	25
1 - Growler for armature testing..... (Snap-on MT-326-220 for 220 V)	55
1 - Condensor Tester.....	100
12 - Hydrometers - Battery electrolite testers.....	21
1 - Ohm Meter.....	50
1 - Valve refacing machine, complete with extra wheel and wheel redresser tools, 220 v/50 cycle.....	398
(Total Shop Equipment).....For'd.....	$38,809

(Total Shop Equipment)..Brot. For'd..... $38,809

Shop Hand Tools and Supplies.

8 - Serviceman's tool kit socket wrench sets (Same or similar to Snap-on)	$ 3,726	
2 - Cylinder hone sets for brake cylinders (1-1/16" to 1-7/8" - Snap-on #925)	31	
2 - Cylinder hone sets 1-7/8" to 2-1/4" (Snap-on #878)	12	
2 - Outside micrometers 0-6 inch	170	
2 - Inside micrometers 0-6 inch	170	
2 - Micrometers depth gauges 0-6 inch	50	
2 - Ring Compressors (Piston) up to 6 inch	4	
2 - Piston Groove cleaners	9	
1 - Reamer & Pilot Set	74	
1 - Combination set NC & NF threads 1/4" to 1" Screw Plates (Little Giant MIG 2)	189	
1 - Gasget cutter kit	20	
6 - "Snap-on" Set combination wrenches OEX-711-K or equal	135	
6 - "Snap-on" feeler gauges	30	
1 - Spark plug tester and cleaner	100	
1 - Front wheel aligning gauge (Bar type) Framel bar	26	
2 - Fuel delivery pumps for steel drums (2 inch bung)	119	
1 - Speed indicator (Starret #107) Revolution counter	7	
1 - Micrometer dial indicator (Brown & Sharpe #7740 with case)	45	
Miscellaneous Small Tools (screw drivers, chisels, oil cans, files, hack saws, snips, etc.)	300	
		$ 5,217

Shop Equipment, Hand Tools and Supplies..... $44,026

Total Estimated Cost of Shop Equipment and Tools (F.O.B.)	$44,026
Shipping Charges	7,974
Total, including shipping	$52,000
Shop Supplies (welding rods, cans, wiping rags, oxygen, etc.)	$ 1,000
Motors and Assemblies for Mechanics Training (including shipping)	$16,000

Estimated costs are for new equipment and tools; however, it is anticipated and recommended that as much of this as possible be secured from excess property. The savings thus generated would allow for acquisition of additional equipment as the Center activities are expanded.

The high cost of electricity (approximately 15¢ per kwh) might warrant the acquisition of a large generator unit from excess property. This could be operated during peak demands.

This list of equipment was prepared with the cooperation of Henry Brignac, AID Heavy Equipment Specialist in Togo.

Parts and Equipment Supplies

Fuel and oil storage for the Training Center is not required as these can be obtained from the Tokoin Public Works area adjacent to the Center with suitable payment arrangements. This may be done by establishing a fuel/oil fund for payment to the GOT Public Works Department as supplies are furnished.

The AID technical assistance program for highway equipment and spare parts is headquartered in the old airport buildings adjacent to the Center site. This includes a parts warehouse located in the old hotel. This area is called the Public Works Department Tokoin Repair and Maintenance Shop Area (see layout plan-Chapter III).

Spare parts may be obtained from this stock on a payment or replacement basis providing the Center equipment is of the same make and model for which parts are stocked.

Initial operators training courses for motor graders and for heavy tractor operation would therefore require acquisition of 3-Caterpillar No. 12 motor graders, three D-7 tractors and bulldozers, and a ripper and scraper pan to match the D-7 tractor.

In the event that the TP stock should prove inadequate, parts for this equipment are available from the dealers in Abidjan or Lagos.

In lieu of purchasing for, stocking and manning an independent parts department for the Center, it is proposed that a sum of money be made available to the Technical Manager to establish a revolving fund for purchase of spare parts, either from TP or the dealers. This will avoid duplication of AID assisted parts departments and the initial outlay for the Training Center will thereby be considerably less.

The desirability of training operators on equipment of different manufacturers is recognized. Standardization in the initial period of the Center is however considered necessary in order to be able to start training as soon as possible and as economically as possible.

As Center operations progress and additional equipment is secured, it is recommended that equipment of different manufacturers be secured consistent with the ready availability of spare parts either from the Public Works Department or from commercial sources.

The first year costs of fuel, oil, spare parts and vehicle repairs and shop supplies estimated at $27,500 would be set up in a special fund under the supervision of

the Technical Manager. A portion of the tuition payments would accrue to this fund each quarter so that expenditures would be covered and thereby a revolving fund be established.

Heavy Equipment Requirements for Operators Training

2 - Caterpillar D-7 Tractors with Cable Controlled Dozers and Cable control unit for scraper pan (One Angle Dozer - One Straight Dozer).....	$ 66,000
1 - Caterpillar D-7 Tractor with hydraulic controlled blade and hydraulic controlled ripper.....	37,000
1 - Set of parts for D-7 hydraulic system, including rings and gasgets.....	500
1 - Scraper (Earthmover) for D-7 Tractor.....	18,000
3 - Caterpillar No. 12 Motor Graders with scairfier attachments.....	54,000
3 - Station Wagons (6 pass. sedan type) at $3,700.....	11,100
1 - Lubrication Unit - Trailer Mounted.....	2,800
1 - Passenger Bus (Excess property).....	1,600
Costs, including shipping -- Total.....	$191,000

Chapter V

CENTER ADMINISTRATION

The Center will be truly regional in nature, servicing all of French-speaking Africa. Not less than 40 per cent of the Center's training capacity shall be reserved for students from countries other than Togo.

Applications from both governmental and non-governmental personnel will be accepted. These shall be processed by the AID mission in the applicant's country and forwarded to the Center Director for appropriate action.

AID Mission Responsibilities

The AID mission in each country shall insure that requirements for admission and trainee rights and responsibilities are met. These shall include:

1. Determination of applicant's aptitude and minimum experience.— It is especially important that applicants whose sole attribute is political sponsorship be weeded out.
2. See that suitable arrangements have been concluded for support of the trainee's dependents while he is in training.
3. See that trainees have return transportation ticket.
4. Require that trainee returns to his country and works in the field for which he will be trained.
5. Require that trainee's employer will re-employ trainee upon completion of training.
6. Insure that trainees are in good health.

Center Director Responsibilities

The Center Director shall be selected by, receive policy guidance and operate under the overall supervision of a Board of Directors. The Board shall be composed of the Director, U.S. AID/Togo, or his delegate, and the GOT Minister of Public Works, or his delegate (see Organization Chart - Chapter I).

He shall recruit, employ and direct all of the personnel required for running of the office and maintenance of the Center. Initially this will include the following:

	Estimated Office & Maintenance Staff Cost - 1st Year CFA
1 - Secretary (Togolese)	325,000
1 - Typist "	275,000
1 - Bookkeeper "	400,000
1 - Janitor "	90,000
1 - Night Watchman "	100,000
1 - Bus Driver* "	170,000
1 - Tool Room Attendant* "	250,000
1 - Nurse " (Assistante Sociale Auxiliaire)	250,000
3 - Chauffeurs "	375,000
Total	2,235,000

2,235,000 CFA = $8,940 (US)

Note: *The bus driver and tool room attendant shall be recruited and employed by the Director, but shall be under the direct supervision of the Technical Manager.

Salaries for these employees shall be met out of tuition.

The Director shall consider all applications and make acceptance on the basis of individual qualifications and availability of space. An attempt should also be made to distribute openings to as many countries as possible.

A listing of rooms available in Lomé for rent to trainees shall be maintained by the Director. He shall be responsible for the reception of trainees, assisting them in securing reasonable living accommodations, and orienting them with regard to the Center regulations and training schedule.

The Director shall secure the passports and return transportation tickets of each out-of-country trainee and shall hold these in safekeeping until the trainee is ready to return to his own country. At the same time each trainee shall receive an identity card showing that he is officially enrolled in the Center for the specific period programmed.

As many rooms available for rent are unfurnished, or inadequately furnished, a furniture pool of cots, tables, chairs and simple wardrobes shall be purchased. The loan of these to trainees shall be administered by the Director. He shall retain 25 CFA per day from the per diem of those using the furniture and have this amount placed in a separate furniture account. This account would be used to replace worn furniture and/or purchase additional furniture if it is needed.

Supervision of payment of the per diem allowance <u>each week in advance</u> shall rest with the Director. For the initial operators class this shall be 525 CFA per day or 3,675 CFA per week for out-of-country trainees who rent furnished rooms. For those who use furniture from the Center pool the weekly payment would total 3,5000 CFA. Togolese trainees who are receiving full pay and living at home while attending classes

would not receive per diem allowances and tuition costs for these trainees would be reduced accordingly.

Transport for administrators and instructors shall be provided for by use of a three station wagon equipment pool. The Director shall exercise control over this pool and shall make assignments to insure that efficient use is made of these vehicles. The station wagons must not be assigned for the exclusive use of any one administrator or instructor. Chauffeurs will be provided for each vehicle in order that they might be adequately maintained and be readily available for multiple transport assignments.

The Director shall make adequate arrangements so that each trainee periodically receives and uses anti-malarial medication to be disbursed by the Center nurse.

Maintenance of discipline and well being of employees and trainees shall be carried out by the Director. If trainees are absent from classes he shall make suitable arrangements so that their residence may be visited and the reason for absence determined.

Technical Manager Responsibilities

Under the overall supervision of the Board of Directors and the Center Director the Technical Manager shall have direct jurisdiction in matters pertaining to the instruction of trainees. This will include supervision over instructors, programming of the classes, use of equipment, control of the Center Shop repair activities, and initiating changes in the curriculum if needed. He shall also assist in classroom instruction.

He shall be responsible for the securing of spare parts, fuel and similar supplies, having direct control over the special account to be set up to cover these items. If such parts or supplies are not readily available at the Public Works Department he

shall have authorization to take the necessary action to obtain these through commercial channels.

The qualifications of applicants shall be reviewed by the Technical Manager and a report submitted to the Director on any that appear deficient. He shall review the work of trainees and, if he considers that any are giving unsatisfactory performance, shall make recommendations to the Director that they be dropped from the program or that other disciplinary action be taken.

As stated in the Project Agreement "the Center may, at its own option, undertake the repair of GOT Ministry of Public Works and Highway Department equipment, for the purpose of providing training opportunity for Center trainees. The GOT shall supply or reimburse the Center for all parts or material used for repair of their equipment. The Center, however, is not to be regarded as a repair shop of GOT Ministry of Public Works or its Highway Department. The Center will perform specialized shop work on privately owned equipment within the objectives of the training program with compensation covering all costs. Such outside work as is undertaken by the Center must advance and be compatible with its training objectives."

The Technical Manager shall be responsible for the carrying out of the above policy and his decisions shall be final, subject only to reversal by unanimous agreement of the two Board members. He shall also maintain close liaison with the Togo Highway Department and conclude workable arrangements for spare parts, supplies and fuel procurement for the Center from the Tokoin Public Works facility. The scheduling for the use of Tokoin shop facilities by trainees, selection of road projects for training activities and scheduling of appropriate repair of Public Works equipment by the Center shall also be coordinated with the Highway Department by the Technical Manager.

The GOT Ministry of Public Works and Highway Department have agreed to endeavor to make its facilities available in support of the Center. The Technical Manager will advise of the need for such support and conclude satisfactory arrangements and programming. This will be essential in the road project activities of the Center which will require that the GOT transport the Center equipment to the job site. The GOT would also be required to install any drainage structures and possibly supply special equipment such as rollers, water tank trucks and asphalt distributors, loaders and trucks not available at the Center.

The need for coordination on such a project is apparent. However, a number of local roads within a short radius of the Center present an opportunity for training on maintenance and improvement activities using the Center motor graders and bulldozers without requiring extensive Public Works Department support.

The plan of operation for the Center requires that a fund be established for the securing of parts, supplies, fuel and lubricants from either the GOT Tokoin Public Works facility or local commercial channels. A fund would be set up under control of the Technical Manager to pay for such materials as they are used. A portion of the tuition fee would be credited to this account to replenish it. The original account to be set up would be sufficient to cover one year's estimated expenditures. This amounts to a total of $26,000 to cover estimated consumption of $15,000 in spare parts, $10,000 of fuel and lubricants, and $1,000 in shop supplies such as welding rods, oxygen, etc.

Amortization of equipment is estimated at $20,000 per year. This amount would be charged against tuition fees and placed in an account for replacement of equipment. Any excess from tuition payments might also be placed in this account for the purpose of securing additional equipment for training purposes as courses are expanded.

Class Schedules

Classes shall operate during the same hours as the Public Works Department. This would be from 7:30 A.M. to 11:30 A.M. each morning Monday through Saturday and from 2:30 P.M. to 5:00 P.M. each afternoon Monday through Friday. Some classes might be staggered slightly to allow more efficient use of the Center bus when a full complement of trainees is enrolled.

Students would be transported from Lomé to the Center (about a 15 minute trip) requiring four one-way trips daily. A bus route and stops will be established transiting a main route through Lomé where students will assemble to be picked up and where they will be discharged.

When a full complement of students is enrolled two bus runs will be required to transport all students and subsequent staggering of class hours will be required.

Road projects selected by the Technical Manager in cooperation with the Togo Highway Department shall be instituted to give practical training to the operator trainees. The trainees will first receive instruction and will operate equipment within the Center training area to develop proficiency and to demonstrate their ability to safely operate the equipment.

Chapter VI

CURRICULUM

Operators

The proposed curriculum for operators is basically a modified version of that which was developed for the Centro de Adiestramiento de Operadores in Mexico. This training center was established in 1955, and the curriculum developed over several years until 1959, when it was formalized. The experience at the Egyptian Training Center in Cairo was also considered in the proposed curriculum for the Regional Center in Togo.

The basic concept is to combine theoretical classroom instruction and practical demonstration. Instruction on any phase of equipment maintenance or operation is followed, preferably on the same day, by practical application. Classes are divided into small units and these units alternate between classroom and field operations.

Each course will extend for a three-month period, the first being proposed for operators from February 15 to May 15, 1964. The 13 weeks in this period would be programmed as follows for class type instruction:

1st week - Reception, orientation, securing quarters, introduction to training objectives, inspection of Center facilities and of the Tokoin Public Works Area, assignment to class units and general instruction on operation of equipment to be used in training.

2nd week - Theory of diesel and gasoline motors, daily maintenance of motors, fuel handling and lubrication requirements, motor lubrication and fuel system operations.

3rd week – Electrical and ignition systems operation, maintenance and repair.

4th week – Cooling system operation and maintenance (radiators, pumps, hoses, thermostat, fan belt).

Drive chain operation, lubrication and maintenance (clutches, transmission, etc.)

5th week – Care of tires, adjustments and maintenance of tracks.

Care of cutting edges on blades and replacement of same.

Operation of dozer blades and operation of motor grader blades and scarifiers. Operation of ripper and earth-moving pan for tractor operators.

6th week – Safe operating procedures – capabilities and limitations of the equipment.

7th week – Operator responsibilities for the maintenance and operation of equipment. Techniques of instructing on-the-job trainees.

8th week – Construction stakes (types and uses). Grading operation on projects using construction stakes.

9th thru 13th week – Most of this time will be devoted to operation and maintenance of equipment on road projects. Short periods of instruction will be held by the instructors as needs arise. Operators performance shall be closely observed and corrective or refresher instruction that is so indicated will be undertaken on the project.

During the same 13 week period equipment demonstration classes will be conducted to supplement formal class presentations. Operators will also be taught to properly operate the equipment within the Center area. As proficiency is gained, the operators will perform actual work on roads in the general vicinity of the Center with an increasing amount of time being spent in such activity. During the 9th through 13th week almost full time will be devoted to such work in the field.

Mechanics

The course of instruction for mechanics shall consist of four 3-month cycles. A more or less formal program of instruction and work assignments is to be offered in the first three cycles. During the fourth and final three-month cycles the trainees will be assigned a variety of repair and overhaul jobs on equipment. This will be done under supervision but conditions of work and assignments shall simulate those to be encountered in regular Public Works repair shops.

The first class of 10 mechanics is scheduled to start on May 15, 1964. Each three months thereafter an additional 10 applicants will be admitted. This will provide an eventual total enrollment of 40 mechanics with 10 graduating and 10 new applicants entering every three months.

It is proposed that motor and other assemblies be available from a variety of manufacturers and that detailed instruction on each be provided. The general subjects to be covered in each cycle are proposed as follows:

First Cycle: Introduction to the various components of construction equipment, their function, operation and service requirements. This will include the drive train, control systems (mechanical and hydraulic), brakes, chassis and motors. With the

exception of motors, which will be dealt with in detail in the second cycle, the various components shall be disassembled, assembled and adjusted by trainees. Preliminary work will be done on assemblies especially prepared for training activities. Later "live" units will be introduced at the discretion of the Technical Manager for repair or overhaul by trainees.

Second Cycle: Basic theory of gasoline and diesel engines. Disassembling and assembling of various engines with detailed instruction on basic components and their function, including fuel and ignition systems. Trouble shooting and emergency repair of engines will also be included in instruction. Initial work will be done on "dead" training assemblies and later live engines introduced for repair or rebuilding.

Third Cycle: Some basic mathematics will be introduced and trainees will receive instruction and practice on machine tool operation, i.e. lathe, brake drum lathe, and crank shaft grinder. Detailed instruction and practice on both gas and electric welding will also be undertaken. Practice on disassembling, assembling and adjustment of diesel injectors and pumps shall also be emphasised as will similar practice on electrical systems and gasoline ignition systems.

Fourth Cycle: Assignments shall be made to repair or rebuild various units of equipment. This shall be done under supervision, but also under conditions which the trainee will be expected to cope with upon graduation. At this time a course shall be introduced on basic instruction technique to better prepare the trainee to help with on-the-job training when he returns to his own country.

Experience in Mexico and Egypt has shown the need for flexibility in curriculum. Weather conditions, class aptitude and other factors influence class and field

schedulings. The proposed curriculum must therefore be considered as a guide and detailed class scheduling be made by the Technical Manager.

In future years additional courses should be developed at the Center. Its class facilities might be made use of part time in training beginning Togolese operators who might be employed by the Public Workds Department in an on-the-job training program. Short courses in specific areas might also be developed to bring experienced mechanics and operators up to date on new equipment developments. (Short courses on automatic transmission, diesel injector and pump repair and calibration and emergency repairs have been successful in other countries). Short courses with the assistance of manufacturers might also be inaugurated as new or specialized equipment is introduced into the region, i.e. asphalt distributors, pavers, loaders, etc.

Chapter VII

TRAINING AIDS

Visual Aids and Training Material in Lomé

Some equipment and materials of this type have been supplied for the U. S. technical assistance program to the Togo Highway Department. These are being used by Mr. Henry Brignac, AID Heavy Equipment Specialist, and will be made available for Training Center use.

This consists of the following:

Visual Aid Equipment Available at Lomé

1 - Bell & Howell Filmosound 16 mm Projector
Model 302 (Magnetic and Optic Sound Tracks)

1 - School Master, Model 500 Projector
Filmstrip and 2x2 slide, 500 watt lamp

Audio-Visual Sound Films - International Film Bureau, Inc.
332 S. Michigan Ave., Chicago 4, Illinois

Item Nos.

1 - ABC of Hand Tools - Part I
2 - ABC of Hand Tools - Part II
3 - Elements of Electricity as Applied to Ignition Systems
4 - Diesel Engine Fuel System
5 - Diesel Lubrication and Cooling System
7 - Carburetor, Principles and Operation
8 - Principles of Operation of Automotive Magneto
9 - Hydraulic Brakes, Principles of Operation
16 - Cooling System and Fuel System
17 - Transmission, Drive Shaft and Differential
10 - (Air Redictopm) Inside Arc Welding
12 - (Coronet) Working Safety in Shop
14 - (Bendix Westinghouse) Air Brakes, Operation and Maintenance
18 - (Willard) Story of the Storage Battery

— Film Strips —

11 - (IFB) Introduction to Oxyacetylene Welding
19 - (IFB) Basic Safety (Complete Series)
20 - (IFB) Oxyaletylene Welding(Complete Series)
21 - (IFB) Automotive Mechanics #1
22 - (IFB) Automotive Mechanics #2

Allis-Chalmers Training Slides

(With Preventive Maintenance Training Manual-English)

1 - HD-6 Tractor
2 - HD-11 Tractor
3 - HD-16 Tractor
4 - HD-21 Tractor
Set of Wall Charts

International Harvester

Shop Talks (Service Manuals)
Wall Charts

Caterpillar Tractor Company Audio Film Strips

(With English Tapes and French Text)

Cat. Nos.			
235-B	D-7 Tractor	241-B	Vertical Starting Engine
242-B	Oil Clutch MG-12	305	Life Time Lubricated Rollers
238-B	5-3/4 Bore, 4-Cylinder Engine	268-B	No. 977 Traxcavator
255-B	933-955 Traxcavator	306	D-8 Series H
256-B	933-955 Traxcavator	313	Runyon Has the Edge
270-B	Constant Voltage Generators	317-B	D-7 Series D Tractor
283	Benjamin Franklin on Track Bolts	321	Facts About Tracks
290	The Edge With a Difference	310-B	Nos. 176, 165, 143 Hydraulic Controls
294-B	Rollers and Idlers with Floating Ring Seals	331-B	977 - Series H Traxcavator
237-B	D-8 Tractor	296	The Perfect Match
326-B	No. 944 Series A - Traxcavator		

Aids Available from Industry

U.S. Construction Industry Manufacturers Association members were requested to supply information on manuals and training aids which they publish and the cost of these manuals if used for the Center.

Replies were received from 20 companies or associations of companies, and samples of manuals and instruction aids were received. These are tabulated by company and their availability indicated.

Power Crane and Shovel Assn., 135 South LaSalle Street, Chicago, Ill.
(Publications Free of Charge to Training Center)

The Functional Design, Job Applications, and Job Analysis of Power Cranes & Shovels - 39 pages - English..... $0.50

Proper Sizing of Excavators and Hauling Equipment
24 pages - English..... $0.50

Power Cranes-Shovels-Draglines, Attachments Traction Operation - 60 pages - English..... $1.00

Hand Signals for Shovel-Crane Operation, Chart - English

J. I. Case Co., Racine, Wisconsin

Operator's Instruction Manuals:

Case Industrial 750 Diesel Crawler - 112 p. English..... $0.50
310 F Utility Crawler Diesel Engine - 50 p. English..... $0.25
Case Industrial W-9A Diesel Unit Loader - 184 p. English..... $0.50
W 7 Industrial Diesel Unit Loader - 112 p. English..... $0.50
W 5-A Industrial Diesel Unit Loader - 92 p. English..... $0.25
Case Industrial W-10 Diesel Terraload "R" 172 p. English..... $0.50
Case Industrial W-12 Unit Loader - 128 p. English..... $0.50
Case Industrial 100 D Diesel Crawler - 118 p. English..... $0.50
The Professional Mechanics Service Manual-Model 800 and 1000 Diesel Crawlers - 291 p. English..... $5.00

Baldwin, Lima, Hamilton Corporation - Construction Equipment Division, Lima, Ohio

Operator's Manual for Lima Special Lifting Crane, Type 64SC, 172 p. English..... $5.00
(Similar manuals are prepared for each individual model of machine manufactured)..... $5.00 each plus shipping

Caterpillar Tractor Company, Peoria, Illinois

(Publications up to 50 copies of each to Center free of Charge)

La Conduite du Bulldozer - 13 p. French
Guide du Conducteur, Pelleteurs sur Pneus, Traxcavator - 15 p. French
Guide du Conducteur, Pelleteurs a Chaînes de Roulement, Traxcavator - 19 p. French
Operators Handbook - 31 p. English
Modern Earthmoving - 24 p. English (only 10 available now due to short supply)
Operators Instruction Manual on Scrapers and Rubber Tired Hauling Units in French will be available in 2 to 3 months

(Many film strips with French text already are available in Togo)

Mack Trucks, Inc., P.O. Box 1000, Somerville, New Jersey

Mack Operation and Maintenance Manual - Trucks with Diesel Engines, 214 p. English

Wisconsin Motor Corporation, Milwaukee 46, Wisconsin

Moteurs Wisconsin - Manuel de Service - 28 p. French

Insley Manufacturing Corporation, 801 North Olney St., Indianapolis, Indiana

Service Manuals are available in English on different models manufactured. These are available at $1.00 each. (Sample forwarded is indicated below)

Insley Type K-L Service Manual, 102 p. - English

Continental Motors Corporation, Muskegan, Michigan

Continental Red Seal Four Cylinder Diesels - Operation and Maintenance Instructions - 114 p. English.....$1.60

Detroit Diesel Engine Division, GMC, 13400 W. Outer Drive, Detroit 28, Michigan

G.M. Diesel Training Aids, 18 p. English
(List of manuals, wall charts, filmstrips, leader's guides and cutaway assemblies)
Cost to Center: Wall Chart Set $10.00, Filmstrips with leader's guide $3.00 up, Manuals $1.50

Cummins Engine Co., Inc., Columbus, Indiana

Parts Book, J-JF-JN Diesel Engines - 28p. English
Parts Book, H-HR-HRF Diesel Engines - 38 p. English

Koehring Overseas Corporation, S.A., P.O. Box 422, Milwaukee 16, Wisconsin

Koehring Operating & Maintenance Manual - Model 605-2A Excavator, 85 p. English
Parsons Maintenance and Operating Manual - Model 77-1A Trenchliner, 87 p. English

The above manuals or similar ones are available on each unit manufactured by Koehring and would be supplied gratis to the Center on request.

Aeroquip Corporation, Jackson, Michigan

Guide for Routing and Installation of Aeroquip Flexible Hose Assemblies, 13 p. English
Type of Seals Used in Fluid Line Connections, 15 p. English
Aeroquip Basic Hydraulics, 44 p. English
Applications for Self-Sealing Couplings in Fluid Piping Systems, 19 p. English
How to Identify Select & Install Hose Lines, 35 p. English
How to Measure & Relate Pipe, Tubing & Hose Sizes, 16 p. English
Guide for Selecting the Aeroquip Hose Style to Use with 112 Common Agents, 9 p. English
The above manuals are available to the Center at no cost.

Pioneer Engineering, 3200 Como Ave., Minneapolis 14, Minnesota

General Service Instructions for Pioneer Equipment, approximately 280 pages - collection of operating instructions on crushers, conveyors, vibrating screens, gravel plants, feeders, bins and bituminous equipment, $5.00 per copy - English

International Harvester Export Co., 180 North Michigan Ave., Chicago, Illinois

Film strips and printed outline manuals as follows (English):

Manual I General Maintenance Group 1-HU Payloader
Manual II Axels
Manual III Torque Converter and P-600 Transmissions
Manual IV Hydraulics

CT Series:

Engine Clutch, TD-14 and TD-18
Transmission and Drive Bevel Gears, TD-14 & TD-18
Steering Clutches and Brakes, TD-14 & TD-18
Sproket & Sprocket Drive, TD-14 & TD-18
Track & Track Frames, TD-14 & TD-18
Hydraulic Steering Booster and Pump, TD-14 & TD-18
TD-24 Hydraulic Steering System
TD-24 Planetary Steering System (Part I)
TD-24 Planetary Steering System (Part II)
TD-24 Synchromesh Transmission
TD-24 Track & Track Frame
TD-24 Electrical System
Transmission and Drive Bevel Gear, TD-20
TD-20 Preventive Maintenance
Scheduled Maintenance TD-25
Scheduled Maintenance, TD-6 & TD-9
Engine Clutch, TD-6 & TD-9
Transmission & Drive Bevel Gear, TD-6 & TD-9
Power Shift Transmission, TD-25B & TD-30

TE Series:

Direct Lift Hydraulic Blades, TD-14, TD-18 & TD-24
Cable Control Units (P-25 & P-29)
Cable Control Unit (Model 110)

Series Eng:

Cooling System, All Series
The International Diesel
Cylinder Head Servicing (Diesel Engines)
Diesel Fuel Injection System
Diesel Fuel Injection System (B-Pump - Part I)
Diesel Fuel Injection System (B-Pump - Part II)

International Harvester Export Co. (Cont'd)

Series Eng. (Cont'd)

Electrical Cranking, Ignition & Generating Systems
The International 817 Series Diesel Engine–Orientation
The International 817 Series Diesel Engine - Cooling System and Cylinder Heads & Valves
The International 817 Series Diesel Engine - Gear Train and Crankcase Assembly
D-817 Series Diesel Fuel System
D-817 Lubrication System
Turbocharge Servicing and Reconditioning
Fuel Injection Pump, Model RD-Principles of Operation & Testing
Fuel Injection Pump, Model R-D - Reconditioning
Engine Servicing, D-236 & D-282
Turbocharger Servicing & Conditioning, Air Research Model T-606 & T-705

Each of the above film strips can be obtained with 8 copies of the accompanying outline for $5.50. International Harvester also supplies Manuals on each of its units.

Huber-Warco Co., P.O. Box 501, Marion, Ohio

Parts and Instruction books are available in English on all models of rollers, maintainers and motor graders manufactured for $1.00 to $2.00 per copy.

The following manuals are also available in English at $2.00 each:

4-D Series Motor Grader Service Manual
6-D & 7-D Motor Grader Service Manual
8-D, 9-D, 10-D and 11-D Motor Grader Operation and Maintenance

Barber-Greene Company, Aurora, Illinois

Operation and service manuals in English are available on each machine and are supplied without charge where they will be of value.

Photographs of equipment in operation are available as enlargements for classroom use at no charge.

Slides, also available at no charge, include views of machines both posed and operating.

Motion Picture Films (16 mm color-sound) are available on the following subjects:

Barber-Greene Continuous Mix Asphalt Plants - English and Spanish
Small Continuous Mix Asphalt Plant - English, French and Spanish

Barber-Greene Company (Cont'd)

Motion Picture Films (Cont'd)

Medium Capacity Continuous Mix Asphalt Plant - English French and Spanish
Barber-Greene Batchomatic Asphalt Plants - English
Barber-Greene Travel Plant - English, French and Spanish
Stabilization Mix Plants - English
Asphalt Maintenance Unit - English and Spanish
Asphalt Paving Machine, Standard Size - English, French and Spanish
Asphalt Paving Machine, Small Size - English, French and Spanish
Wheel Ditcher - English, French and Spanish
Vertical Boom Ditcher - English
Ladder Type Ditcher - English
Aggregate Producing and Handling - English
Material Handling - English
Portable Conveyors - English
Bucket Loaders (Crawler Mounted) - English, French and Spanish
Bucket Loaders (Pneumatic Tire Mounted) - English
Windrow Loader - English

Price lists on these films were not available at the time of publishing of this report, but they were expected to be made available shortly.

This listing is not intended to indicate all of the materials available from U.S. Industry but to give a cross section of the variety of training aids produced and their cost.

Chapter VIII

IMPLEMENTATION OF REGIONAL TRAINING CENTER

The first requirement for the implementation of the proposed Training Center is approval of a plan of operations by the AID/Washington officials having jurisdiction. Their decision concerning building requirements would have to be transmitted to AID/Togo in time for the GOT to make bid advertisement by June 15, 1963. This should include appropriate waiver and Sec. 611 clearance if buildings are to be completed prior to the opening of operator and mechanics classes.

The next step which should follow soon thereafter would be the procurement of the heavy equipment for operator training and the shop equipment and tools for mechanics training. Supplies and training aids would be the next priority along with recruitment of U.S. financed personnel.

Construction

Buildings to be constructed at an estimated total cost of $109,000 include an administration building, a workshop and an equipment shed. Messrs. Wagner and Coster, AID/RHT/Lagos submitted estimates on these buildings in 1962 as follows: Workshop $68,000 and Administration Building $27,400. The equipment shed, which the IREF team feels will be essential, is estimated to cost $5,000, based on costs of similar sheds being constructed under the AID/Togo program with the Ministry of Public Works. Shipping and other costs have risen in the past year and therefore a contingency sum of $8,600 was added to bring the total to the estimated $109,000.

A two month time lag is anticipated between advertising for bids and start of construction. The Administration Building and Equipment Shed are scheduled for

completion six months thereafter and the workshop is to be completed in an additional three months.

Advertisement and letting of bids as well as architectural and engineering supervision of construction would be done by the GOT. AID would have the privilege of inspection and review of the work at any time during construction.

It would be desirable for AID/Togo and the GOT to designate their respective members on the Regional Training Center Board of Directors as soon as possible. They would then be better prepared to coordinate activities in Togo as the project develops.

Procurement

It is proposed that as much of the equipment and supplies as is reasonably possible be secured from excess property. A coordinator for the project should work with the AID Materials and Resources Section to earmark equipment and material, insure that it is suitable, and follow through on assembling this for shipment to Togo. Arrangements for assembly of various items at a convenient location and the consequent larger and less frequent shipments would greatly expedite receipt and handling at Lomé.

Equipment not available from excess property should be procured through normal AID channels with the assistance of the project coordinator. In order to carry out the plan of operations some items must be secured on a negotiated basis, i.e., heavy equipment of a make and model consistent with spare parts available at the Tokoin Public Works Parts Warehouse which will be used by the Center.

These items as well as items to be secured on a bid basis should be assembled for quantity shipment if at all possible.

In any event all equipment and supplies for operator training must be shipped from the U.S. prior to November 15, 1963, if the Center is to open on schedule on

February 15, 1964. Shop supplies and equipment should be shipped prior to January 15, 1964, in order to insure delivery and installation prior to the scheduled opening of mechanics classes on May 15, 1964.

In some instances it might be desirable to procure items of office equipment from local or other non-U.S. sources. Eight thousand dollars has been estimated for these items. It appears reasonable that the two member Board of Directors make a decision on office equipment requirements and sources. Procurement could then be finalized by AID/Togo.

Training aids, motor and equipment assemblies for training and equipment manuals for the Center Library should be obtained by the project coordinator and shipped. Much of this material is expected to be provided by U.S. industry.

Excess Equipment Inspection

The securing of excess property for this activity requires assurance that such items are suitable both as to make, model or size and physical condition. It is proposed that the project coordinator have authority to arrange for on-site inspection and/or testing of the major items prior to their acceptance for the project.

Shipping and Delivery

As stated previously the shipment of items should be concentrated in order to expedite delivery and handling at destination. Lomé has a relatively small pier and lighter type of port facility and small shipments are thus often delayed due to transshipment en route.

The project coordinator shall keep records on all shipments and deliveries and institute steps necessary to trace any delayed items. Mr. Henry Brignac of AID/Togo should be designated to receive and store items destined for the Center. He has suitable

storage space available at the Tokoin Public Works Area which is across the road from the Training Center, and this operation was discussed with him by the IREF team.

Recruitment

The Center Director should be selected by the Board of Directors and start work by December 15, 1963.

The Technical Manager and Assistant Technical Manager should be on the job no later than January 15, 1964, and the chief instructor for operators no later than February 1, 1964. The other chief instructor for mechanics should be in Togo no later than April 1, 1964, so that he might assist in setting up the shop equipment and tool rooms.

Assistant instructors from the Peace Corps highway team should be selected by Mr. Brignac and the Center Board of Directors and assigned to the Center at least two weeks prior to their assumption of class duties.

The Center operating staff should be recruited by the Center Director and employed not later than January 15, 1964. They would thereby be able to be trained in carrying out their respective assignments and also assist the Director in moving into and setting up the equipment necessary for operating the facility.

Processing Applications

Applications for training shall be processed by the AID mission in each country and forwarded to the Center Director at least three months in advance of the class starting date for which application is made. In the event that a Center Director is not appointed in time to receive the initial applications for the February 15, 1964 class, these applications shall be sent to the Center Board of Directors.

The Center Director, assisted by the Technical Manager, shall review the applications and make acceptances on the basis of individual qualifications and availability of space. An attempt should also be made to distribute openings to as many countries as possible.

AID missions concerned shall be advised of acceptances as soon as possible and in no case later than two months previous to the start of the class opening date for which application is made.

If space does not allow acceptance of applicants these shall receive priority for the next class.

Support of U.S. Technicians

Estimated costs for the salary and support of the two U.S. technicians is shown in Chapter I under the headings "Contract Services/Technicians" and "Other Costs." The estimated cost of house furnishings was listed as a separate item in this itemization and was not included in the heading "Estimated Costs - U.S. AID Financed Technicians" of Chapter II.

The reason for this is the recommendation that this allowance for furniture be made available to U.S. AID/Togo. They would then order and retain title to this furniture for continued use of U.S. AID financed technicians.

The itemization referred to previously in Chapters I and II did include a $700 per month housing allowance for each of the two U.S. technicians (Technical Manager and the Assistant Technical Manager). It was suggested by Mr. W. B. Hussey of U.S. DCM/TOGO that it might be preferable to have the mission obtain and supply the housing for these two technicians as is done for U.S. AID employees.

This appears to be a desirable recommendation and if implemented the funds required should be obtained from the training project.

In the case of the two U.S. AID financed third country nationals (chief instructors) it is recommended that they be paid the $600 per month housing allowance shown in Chapter II and be responsible for obtaining their own furnished housing and payment of utilities.

Chapter IX

OBSERVATIONS ON CAO, MEXICO

The Centro de Adiestramiento de Operadores (CAO) in Mexico City was visited from March 25th through 29th, 1963, by W. C. La Baugh of the IREF team. Discussions were held with Engineer Jesus Ansotegui, Director; Sergio March, Secretary; Emilio Tello, Instructor; Guillermo Aguilar, Instructor; and Enrique Lopez, Instructor of the CAO. Others contacted during this time were: J. J. March, Director General, Mexican Road Association and Richard L. Duncan, Training Officer of AID/Mexico, who have both had a direct interest in CAO.

An agreement between Mexico and the U. S. (ICA) was signed on April 6, 1954 calling for the establishment of the CAO. An existing building and ground were donated by Mexico and the building renovated for shop teaching. Inauguration of the building was held on July 28, 1955.

Original official sponsors were the Secretariat of Communications and Public Works, the Asociación Mexicana de Caminos and the I.C.A.

The CAO Board of Directors was and still is composed of two government officials, two AMC officials and one representative of private business selected by the other four members.

The U. S. International Cooperation Administration, the Government of Mexico and the Mexican Road Association initiated the CAO and supplied substantial financial support. The GOM supplied the land and building and spent approximately $24,000 for rehabilitation of the building and approximately $100,000 into a joint

fund for U.S. Surplus Equipment procurement. In addition the GOM and Mexican Road Association furnished $48,000 toward the first year's operations and $72,000 per year in subsequent years.

The Center is no longer receiving a subsidy and is trying to make its own way. Tuition covers 30 - 40% of operating costs and the balance will now have to come from other sources.

Income is derived from rental of equipment, sale of products made by the trainees (jacks, hammers, crankshafts, etc.) and from work completed on the road construction projects undertaken by the CAO for the government. The CAO functions as a contractor and is paid by the government for work performed.

Originally almost all work was performed by trainee operators. Recently the CAO has undertaken projects with skilled paid operators with trainees as the helpers to these operators. This allowed for increased production and funds to pay for the center operations. Students will receive a small salary under this new plan.

U. S. assistance from 1954 through 1961 totaled $283,000 about half of which was for a contract for technical assistance with the University of Michigan. Approximately $100,000 of the U. S. assistance has gone into a joint fund for procurement of U. S. Surplus Equipment.

The University of Michigan supplied two full time technicians as consultants and advisors in the initial development period under the ICA contract.

The first courses offered were in welding, automotive repair and heavy tractor operation.

Although the original plan was to provide dormitories, this never has been done. Students live in the city. A school bus operates down a main street (Insurgentes)

to the Center and picks up students along the way. Pension costs in the city were quoted as 600 pesos per month ($48).

Classes are held from 8:00 A.M. to 3:00 P.M.; from 9:00 A.M. to 4:00 P.M. and from 10:00 A.M. to 4:00 P.M. with one hour for lunch. The library and cafeteria are used for study halls by the students.

Foreign students all take the instructor training classes as part of their work. AID sponsors these students and pays the full cost for training. These students also receive a $6 per diem while in school and $10 while in travel status.

The original cafeteria was not adequate and a new building was constructed. This is approximately 30 feet wide and 40 feet long and cost $5,000 to construct and equip. It was estimated that today it would cost $8,000.

The original cafeteria was converted to a library.

From its inauguration in the last semester of 1955 to the end of 1962, CAO enrolled 3,699 students, 2008 of which completed their course and 223 of which were then in process of completion (1,468 were dropouts).

Of the 2,008 graduates there were 1,099 mechanics, 756 operators, 114 welders; 38 completing the instructor training course and one completing the newly instituted lathe operator course. Following is a breakdown of graduates:

COURSE	1955	1956	1957	1958	1959	1960	1961	1962	Totals
Welding	4	18	5			31	35	21	114
Trac. Agr.		24	10	7					41
Shovel		2	26	29	51	45	39	22	214
Heavy Tractor			13	16	19				48
Scrapers			20	15	17				52
Tractors & Rubbertired Scrapers				8	60	75	54	24	221
Motor Grader			15	20	55	42	31	17	180
Mec. Auto		16	26	66	42	51	58	49	308
Mec. Diesel		24	94	161	114	136	119	110	758
Emergency Auto Mechanics							14	17	31
Diesel Injection Pump								2	2
Lathe Operator								1	1
Instructor Training							34	4	38
Totals	4	84	209	322	358	380	384	267	2008

Enrollment started at 195 students at inauguration and reached a high of 585 students in the first semester of 1958, with a decline to 356 enrolled in the first cycle of 1963. Of these 356 students 133 were new enrollees. Tuition in 1958 was 250 pesos and in 1963 averaged 1,500 pesos for each four-month semester. This tuition covered approximately 30% of the operation cost for the semester.

Enrollment in the mechanics classes has been relatively consistent while enrollment in operator training classes was highest in the period from 1957 thru 1959. Night classes were held for mechanics but were discontinued due to high cost per pupil and poorer pupil performance than in daytime instruction classes. A course in agricultural tractor operation and maintenance was started in the second semester of 1956. By the end of 1958 it was discontinued after having graduated 41 students.

The following tabulation shows trends in new enrollments and graduations by semester:

Statistics on Student Enrollment at CAO

Year	Semester	New Students Enrolling		Students Graduated	
1955	3	195		4	
1956	1	186			
	2	25		21	
	3	142		63	
1957	1	233		80	
	2	213		67	
	3	147		62	
1958	1	261		78	
	2	154		85	
	3	120		159	
1959	1	195		119	
	2	199		117	
	3	184		122	
1960	1	174		128	
	2	213		139	
	3	146		113	
1961	1	170		111	
	2	169		109	
	3	184		164	
1962	1	169		110	
	2	118		77	
	3	93	3,699	80	2,008
1963	1	133			

Courses are for a 15-week period (three per year).

Operators complete a program in one 15-week cycle while mechanics must complete four 15-week cycles. Some specialized 15-week courses have also been introduced for mechanics training. Twelve different course programs are now offered to incoming students. These are:

1. Welding Course (15 week)
2. Power Shovel Operation (15 week)
3. Tractor and Earthmoving Scraper Operation (15 week)
4. Motor Grader Operation (15 week)
5. Diesel Mechanic (4 - 15 week cycles)
6. Automotive Mechanic (4 - 15 week cycles)
7. Lathe Operation (2 - 15 week cycles)
8. Diesel Injectors and Pumps (15 week)
9. Training course for Industrial Instruction (15 week)
10. Automatic Transmissions (15 week - Afternoons)
11. Emergency Automotive Repairs (15 week - Afternoons)

Tuition is paid by the student and averages 1,500 pesos per 15-week cycle.

Detailed outlines of the curriculum, copies of all forms and requisitions used for administrative and fiscal control, a plan of the school layout and photos of the Center and the road construction activities were obtained. These were very helpful in development of a plan for operation of the Togo Training Center but have not been included in this report due to physical limitations.

Chapter X

OBSERVATIONS ON EGYPTIAN TRAINING CENTER

The Egyptian Training Center in Cairo, Egypt, was visited from April 8th through April 11th, 1963 by W. C. La Baugh. Discussions were held with Ali Kamel, Undersecretary, U.A.R. Ministry of Communications, as the Center is under direct control of the Ministry.

Other meetings were held with Dr. Ahmed Mounir El-Barbary, Director of Public Transport of Cairo (2-1/2 million riders per day); Engineer A. Azab Karim, Director of the Training Center; and with Engineers Yossef Ezzeldine, Yousef Fahmy Ibrahim, Ahmed Sayed Youssef and Mohamed Ibraham M. Shaker Kamel.

Training for equipment operators started in 1955. Requirements were established calling for literacy and that applicants be 20 - 50 years of age. Employees of the Department of Roads & Bridges and other Government entities were selected, receiving pay and also subsistence allowance if from outside of Cairo.

Courses originally programmed for two months were modified as conditions warranted. Many short courses have been held to train operators as new types of equipment were purchased for use by the Department of Highways, i.e. mixers, distributors, soil stabilizing equipment, etc.

Three mechanical engineers are assigned to the Center as classroom instructors for equipment operation and maintenance. Practical field demonstration is done by trained operators assigned to the Center. Classes usually number 20 students.

A large part of the Training Center activities and facilities are devoted to training of engineers and engineering technicians. At the time of the IREF inspection no classes for operators were currently being held, although a course for operators from Yemen had recently been completed.

The U.S. I. C. A. participated in the initiation of the Training Center as one phase of a technical assistance program to the U.A.R. The assistance was provided under contract with Charles Upham and Associates, Washington, D. C., one part of which provided for training of engineering and related staff and to advise on training equipment requirements and to participate in class training. The contract became effective August 18, 1955.

From 1955 through 1962, there were 330 engineers, 189 engineering technicians, and 715 operators who received training. Following is a breakdown of the operators trained each year.

Year	Number of Classes	Number of Trainees
1955-56	4	173
1956-57	7	119
1957-58	5	143
1958-59	3	57
1959-60	11	104
1960-61	5	44
1961-62	8	75
	43	715

The Training Center at present has the following equipment available for training purposes which they estimate has cost $225,000: 4 motor graders; 2 maintainers; 4 tractors with bulldozers, 5 rollers, 2 loaders, 5 soil stabilization machines, 2 wheel tractors, 1 asphalt distributor, 1 lubrication unit, 1 compressor

and other various small units such as spreader boxes, asphalt patching kettles and concrete mixers.

Training of mechanics is not done at the Center. Instead this is being accomplished by on-the-job training in the various shops of the Ministry of Transport.

Courses for operators of tractors with bulldozers, motor graders and maintainers are scheduled for two months each. This is adjusted to each class, dependent on how fast the students accomplish their objectives.

The cost of the Center is paid by the Ministry of Transport and no tuition is charged. Trainees receive regular pay while in training and a living allowance if they are from outside of Cairo. Training Center buses supply transport between the Center and the Cairo bus service area.

Upon completion of training these men are assigned jobs with the highway department at a considerable increase in pay as operators.

Contact was made with AID/Egypt but no discussion was possible due to the fact that Mr. Wm. Hays, AID Director of Transport and Industry, was on assignment in Alexandria.

APPENDIX No. 1

Proposed Revised Project Agreement
ANNEX A

Regional Heavy Equipment Operators
& Mechanics Training Center,
Lomé, Togo.

I. General Description

Under this agreement the Government of the Togolese Republic (hereinafter referred to as the GOT), and the United States A.I.D. Mission (hereinafter referred to as USAID), agree to cooperate in the development of a Regional Heavy Equipment Operators & Mechanics Training Center (hereinafter referred to as the Center).

The Center will be located in Lome, and will be available to qualified French-speaking participants from African countries. Its basic objective will be the training of government and private sector personnel in the operation, maintenance and repair of public works construction equipment.

In many of the newly independent African States there exists an urgent need for trained operators and mechanics qualified to work with various types of heavy earth moving equipment - crawler tractors, scrapers, graders, front end loaders, power shovels, dump trucks, cranes, etc.

As a first priority need, training facilities must be developed to meet the serious shortage of personnel who can effectively operate this equipment and perform first and second echelon maintenance. These skills include lubricating the unit, making preventive maintenance checks and performing minor adjustments in the field. Lack of trained personnel has caused an unduly high percentage of deadlined equipment, thus severely hampering essential public works construction programs in many African countries. The problem, currently serious, will become progressively more so as more and more heavy construction equipment is imported into Africa, and the pace of public works actively quickens. Some of this equipment has been financed by A.I.D. and additional equipment is programmed for procurement.

Initially, the Center will focus on the training of operators as described above. Such training will be accomplished in approximately 3 month cycles, which includes both classroom instruction in the theory of the equipment, and actual on-the-job training. This field work (physical demonstration with the machine itself), will be accomplished by having the trainees work on demonstration road construction projects, or actually at the task of maintaining existing roads by operators such as ditching and leveling. The precise curriculum shall be determined by the Center Director in cooperation with the instructor staff.

The Center's scope may be expanded to include the training of more specialized shop skills, oriented toward training personnel equipped to perform higher level shop maintenance, vehicle overhaul, etc. Thus, the curriculum may be expanded to include courses such as welding, general diesel engine overhaul, transmisstion and final drive

repair, and so on. This later phase of the Center's operations would include both refresher courses, and courses designed to upgrade the skills of heavy equipment shop mechanics with a view toward producing master mechanics. They, as well as the operator trainees, in turn would furnish upon return to their own countries, the cadre for local training activities and assure a "muliplier effect".

II. Regional Character of the Center

It is understood by the signatories to this agreement that the Center shall be truly regional in nature, servicing all of French-speaking Africa. In this respect, during the first year of the Center's operation, not less than 40 percent of the Center's training capacity shall be reserved for students from countries other than Togo.

Applications from both governmental and non-governmental personnel will be accepted. Non-Togolese trainee candidates for the Center shall be accepted, upon application or after nomination by their respective governments, by the Center administration on the basis of individual qualifications and availability of space. Admission shall be without regard to the applicant's country of origin. The GOT undertakes to facilitate the entrance into Togo of trainees from other countries.

III. Administration of the Center

The Director, USAID/Togo, or his delegate, and the GOT Minister of Public Works, or his delegate, shall jointly administer the Center. The above mentioned parties shall select a Center Director who will have responsibility for the Center's operations, subject to policy guidance and under the over-all supervision of the above mentioned parties. This responsibility shall encompass all matters relating to the Center including curriculum, class size, rate and direction of expansion, financial arrangements (such as tuition costs), selection of students, discipline, personnel, accounting operations, and other problems relating to the Center that may arise during the course of its operation. The Director will be assisted by a Chief Technical Advisor, who will be provided by A.I.D. Preference will be given to the appointment of a Togolese citizen as Director.

IV. Trainees, Tuition, Travel and Living Costs

Countries, agencies, or private groups sponsoring trainees will, (a) pay travel costs, tuition and living expenses of individuals so sponsored, and (b) if the trainees are employed at the time of assignment, pay them a full or at least a reasonable share of their normal working income in order to make possible the support of dependents, if any. Tuition rates will be determined by the Director, with the objective of placing the Center on a financially self-sustaining basis as soon as is practicable.

V. Specific Activity Targets or End Results of the Project

At the end of the first year of the Center's operation, it is expected that three classes of operators will be graduated. Each graduate will receive a suitable document certifying his successful completion of the course.

Center operations are to be placed increasingly on a self-sustaining basis with the help of income from tuition fees and from other sources.

VI. Relationship of Center to GOT Ministry of Public Works and to Other Sectors of Togolese Economy

The Center may, at its own option, undertake the repair of GOT Ministry of Public Works and Highway Department equipment, for the purpose of providing training opportunities for Center trainees. The GOT shall supply or reimburse the Center for all parts or material used for repair of their equipment. The Center, however, is not to be regarded as a repair shop of the GOT Ministry of Public Works or its Highway Department. The Center will perform specialized shop work on privately owned equipment within the objectives of the training program with compensation covering all costs. Such outside work as is undertaken by the Center must advance and be compatible with its training objectives.

The GOT Ministry of Public Works and Highway Departments will endeavor to make its facilities available in support of the Center. This will include, in particular, providing opportunities for on-the-job training, making available without charge the Tokoin shop facilities and making available the Tokoin stock of parts and fuel and lubricant supply on a cost basis.

VII. Specific Obligations of this Agreement

A. U.S. Contribution

Subject to adequate project planning progress, the U.S. contribution from FY 1963 funds will be as follows:

1. Contract Services Technicians. $216,600

Provide and finance technical staff consisting of a technical advisor, an assistant technical advisor and two instructors, other than provided for in VII B below, including salaries, cost of transportation and other expenses.

NOTE: PIO/T to be issued by AID/W. A.I.D. may unilaterally deobligate or reobligate these funds in part or in full whenever in its judgment such action is warranted.

2. Commodities $260,000

(a) Necessary commodities for conduct of training and demonstration activities. Representative examples include shop equipment and tools, office supplies, training aids, vehicles for Center transportation use, etc.

(b) Heavy earth moving and other construction equipment for the exclusive use of the Center.

NOTE: Specifications of the above commodities will be contained in the sub-obligating PIO/C's which will be issued by AID/W. Unless AID/W determines otherwise, procurement shall be from U.S. sources.

3. Other Costs: $190,400

(a) Construction and furnishing of buildings for the Center, to consist of an administrative building, a workshop and an equipment shed. Final cost of construction of buildings will be determined by award of bid procedure subject to $109,000 maximum availability of funds. Bids are to comply with plans and specifications now being finalized by GOT/TP and which are to be approved in final version by USAID/Togo.

(b) Construction of roads and walks estimated at $6,000 and to be constructed by the TP.

(c) Household furniture ($10,000), rented houses ($29,400) of two U.S. Contract technicians, furniture pool for trainees required to rent unfurnished rooms ($2,000). Total of these not to exceed $41,400, and office equipment not to exceed $8,000.

(d) Shop supplies of an expendable nature such as welding rods, spare parts, fuel and lubricants, and similar items: $26,000

B. The GOT is specifically obligated by this agreement to furnish:

1. The land and such existing facilities as access roads, power lines, water system, etc., in the area of the Old Lome Airport. The area of land shall be sufficient in size to serve as a vehicle park and training area for equipment operations. The GOT will also make available, if needed, training areas adjacent to the Center for use during the field aspects of the training cycle;

2. One official to act full time as Center Director, and two full time (or, if impractical, part time) qualified Public Works mechanics or operators to act in the capacity of assistant instructors upon activation of the Center. The GOT will be responsible for their salaries and maintenance expenses for the initial 2 years of Center operations;

3. The GOT will provide A&E services required for the design, award of contract and construction of the Center buildings. The GOT further agrees to contribute any available additional services of its Public Works Department on a cost basis to USAID, for the construction and equipment of the requisite facilities;

4. At the discretion of the Center Director, the GOT will make available to the Center training and demonstration equipment procured during FY 1961 under project 693-F-31-AA (693-31-003), dated June 3, 1961;

5. The GOT will furnish such other services and supplies within the limitation of available resources as are required to meet the objectives of this project.

C. Tuition is obligated to defray the cost of operation of the Center such as:

1. Cost of utilities
2. Salaries of office staff, janitors and chauffers
3. Student per diem
4. Medical service
5. Spare parts and supplies expended.

VIII. Special Provisions

A. It is specifically agreed that the use of U.S. funds for this project will be limited to the procurement of goods and services from Free World sources, as defined by AID.

B. Considering that the establishment of a Regional Training Center is a new activity the GOT and USAID agree to adopt whatever modifications, adaptations and revisions may become necessary for the execution of the project within the framework of its basic objectives.

C. Done in both the English and the French language; in case of conflicting interpretation, the English language version will prevail.

REPUBLIQUE TOGOLAISE
TRAVAIL - LIBERTE - PATRIE

MINISTERE DES TRAVAUX PUBLICS
MINES, TRANSPORTS, POSTES ET TELECOMMUNICATIONS

SERVICE DES TRAVAUX PUBLICS

PROJET

CENTRE REGIONAL DE FORMATION PROFESSIONNELLE

BUREAU

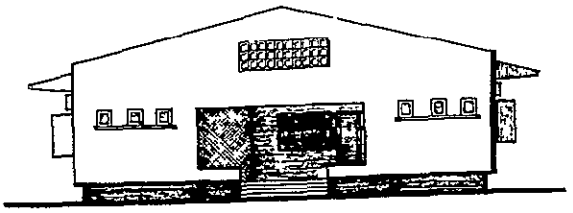
PLAN D'ENSEMBLE

ECHELLE: 0.01 P.M.

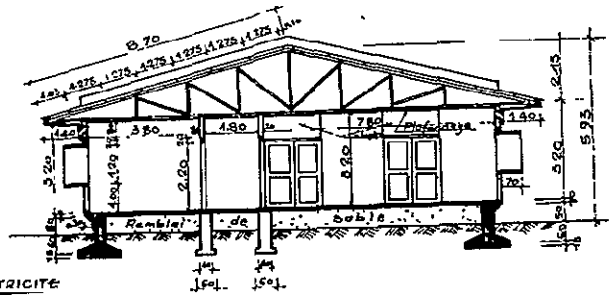
DATE	MODIFICATIONS	OBSERVATIONS	SIGNATURES
			Le Soumissionnaire
			Le Chef du Bureau d'Etudes
			L'ARCHITECTE
			Le Directeur des T.P.

PLAN N° 36 / BE / 62 / T.P.

FACADE PRINCIPALE



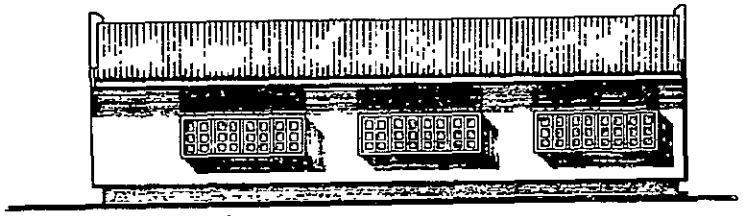
COUPE TRANSVERSALE A.B.



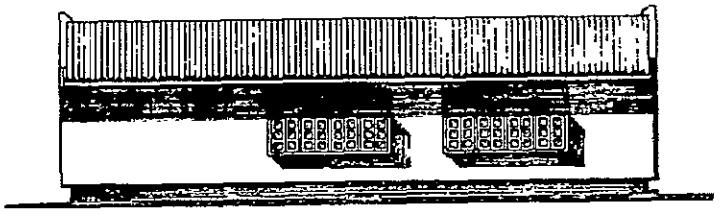
LEGENDE ELECTRICITE

- POINTS LUMINEUX PLAFOND
- POINTS LUMINEUX - HUBLOT
- INTERRUPTEURS SIMPLE ALLUMAGE
- PRISSE DE COURANT FORCE
- PRISE DE COURANT SIMPLE

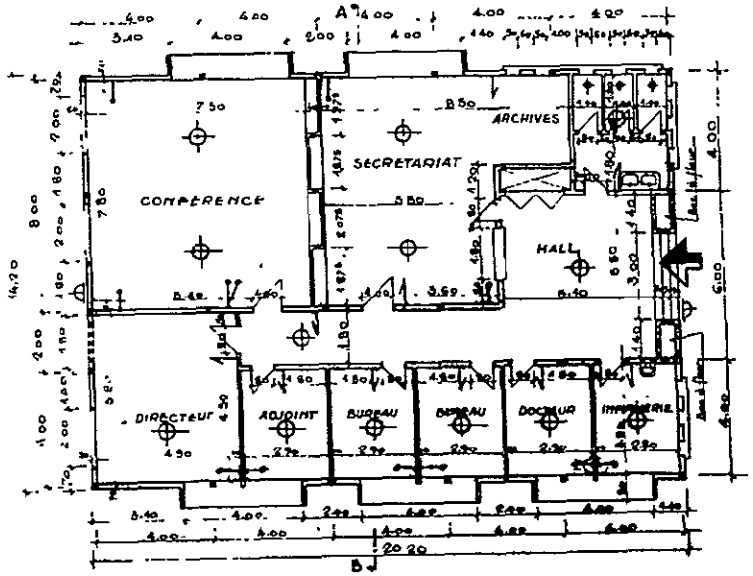
FACADE LATERALE GAUCHE



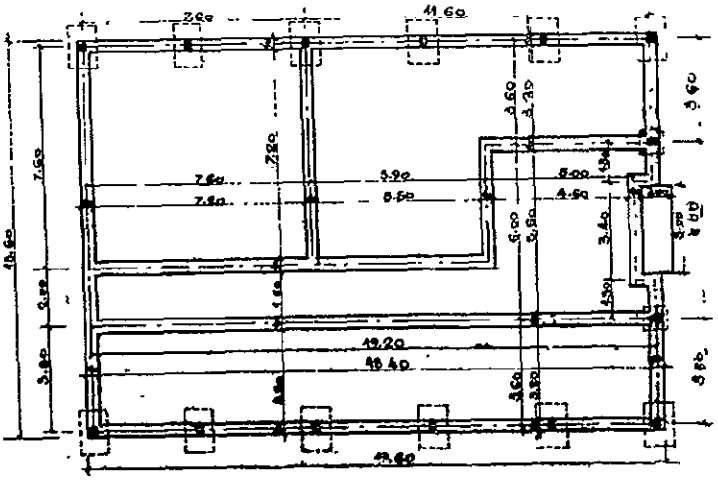
FACADE LATERALE DROITE



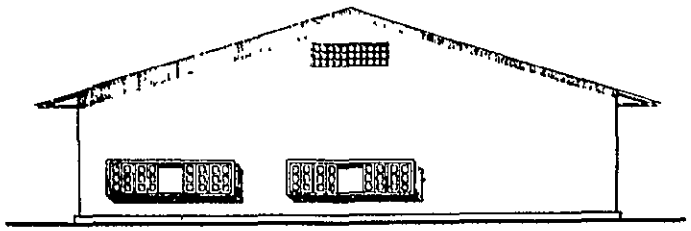
REZ - DE - CHAUSSEE



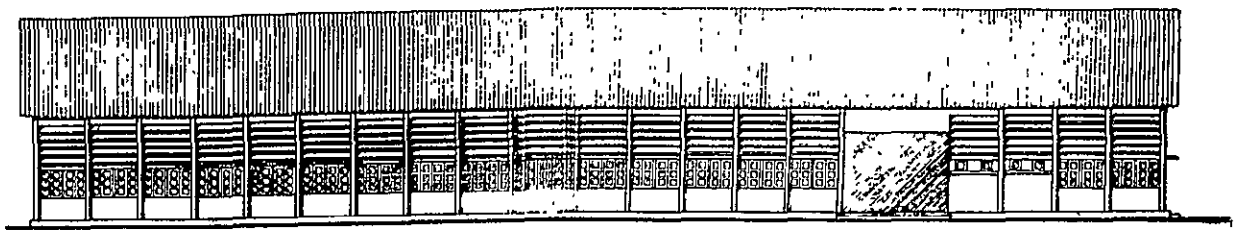
PLAN DES FONDATIONS



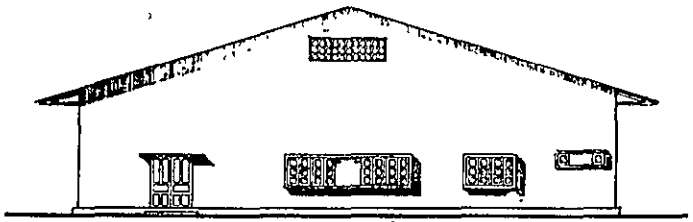
PROFIL DROITE



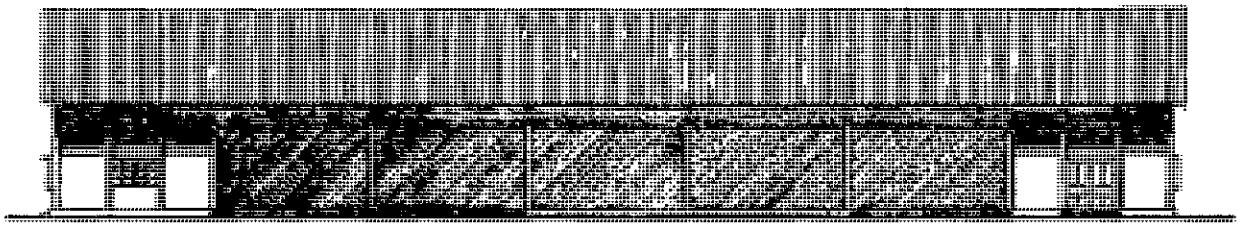
FACADE POSTERIEURE



PROFIL GAUCHE



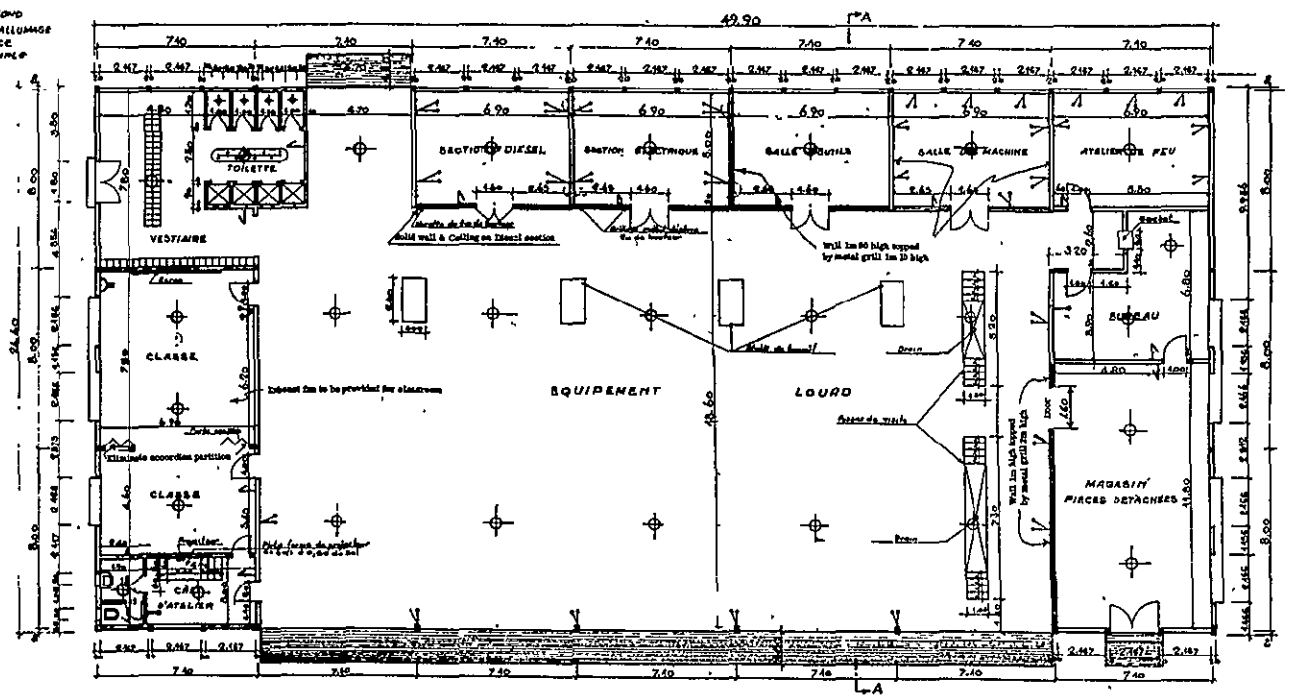
FACADE PRINCIPALE



VUE EN PLAN

LEGENDE ELECTRICITE

- POINTS LUMINEUX PLAFOND
- INTERRUPTEURS SIMPLE ALLUMAGE
- PRISE DE COURANT FORCE
- PRISE DE COURANT SIMPLE



REPUBLIQUE TOGOLAISE
TRAVAIL LIBERTE-PATRIE

MINISTERE DES TRAVAUX PUBLICS
MINES, TRANSPORTS, POSTES ET TELECOMMUNICATIONS

SERVICE DES TRAVAUX PUBLICS

PROJET
CENTRE REGIONAL DE FORMATION PROFESSIONNELLE

ATELIER

PLAN - FACADES
ECHELLE : 0,01 P M

DATE	MODIFICATIONS	OBSERVATIONS	SIGNATURES
			Le Dessinateur Le Chef de Service Le Directeur des TP
			L'ARCHITECTE

PLAN N° 35 /A.4 /62 / T.P

NOTE:
Final revisions recommended by ILO Expert are typed in English

APPENDIX No. 4

WORK SCHEDULE

William C. La Baugh, Jr.

March 18-23, 1963

AID briefing by Messrs. Bruce Hahn, AFE/ID and A. H. Ellis, AFE/DF. Reviewing past correspondence and files on project and compiling information on AID Mission responses concerning the training needs of the area.

March 25-29, 1963

Conferring with officials and instructors and studying the operations at the CAO training facility in Mexico City.

April 1-5, 1963

Compiling notes on CAO operations, conferring with AID officials, reviewing reports of Professors Vezani and Kline, obtaining visas and completing travel arrangements.

April 7, 1963

En route to Cairo, Egypt, U.A.R. from Washington, D. C.

April 8-12, 1963

Conferring with officials and instructors and studying the operations of the Operator Training Center in Cairo.

April 12-15, 1963

En route to Lomé, Togo, via most direct route which was by way of Khartoum, Sudan, and Lagos, Nigeria.

April 15-May 2, 1963

Lomé, Togo: Studying local conditions, conferring with GOT and AID officials, conferring with local contractors and businessmen, inspecting Training Center site, reviewing proposed building construction plans, reviewing AID/TOGO country program and its inter-relationship with Training Center activities (see Appendix No. 6 listing contacts in Togo).

May 2 - 3, 1963

En route to Washington, D. C. via most direct route by way of Cotonou, Dahomey; Accra, Ghana, and New York City.

May 20 - June 14, 1963

Conferring with AID officials concerning proposals for implementation of the Center, preparing the report on a recommended program and supplying various AID officials with information required to initiate action on the establishment of the Center.

André Bougon

April 13 - 15, 1963

En route from Rome, Italy to Lomé, Togo, via most direct route by way of Lagos, Nigeria.

April 15 - May 2, 1963

Lomé, Togo: Working with W. C. La Baugh (see details listed previously).

May 2, 1963

En route Europe via Cotonou, Dahomey and Abidjan, Ivory Coast.

Appendix No. 6

REGIONAL TRAINING CENTER - LOME, TOGO

Contacts in Togo, April 15 to May 2, 1963:

Mr. Marchal, Director of Public Works

Mr. Gaston Dossou, Technical Advisor, Ministry of Public Works

Mr. Georges Coustere, Architect, MPW

Mr. Christophe, Highway Construction Contractor and Local Industrialist

Mr. Pette, Equipment Engineer, Compagnie Togolaise des Mines du Benin (Phosphate mine and plant at Kpeme)

Mr. Lechat, Quarry Manager (above company)

Mr. Marcel Houver, President, Chamber of Commerce, and Executive of CFAO (Trading Company)

U. S. Ambassador Leon B. Poullada

Mr. Wm. B. Hussey, U.S. D. C. M.

Mr. Harry J. Petrequin, Acting Liaison Officer, AID/TOGO

Miss Helen Miklus, Assistant AID Program Officer

Mr. Henry Brignac, AID Heavy Equipment Specialist

Mr. Egon Hill, AID/TOGO Controller